The University of Pécs
Medical School

GENERAL MEDICINE
Major

STUDY PROGRAM
2010/2011

Subjects of the
Basic module
(obligatory subjects)

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OAAANT BEHAVIORAL SCIENCE 1 (MEDICAL ANTHROPOLOGY)

Course director: **DR. ZSUZSANNA FÜZESI**, associate professor
Department of Behavioural Sciences

1 credit ▪ semester exam ▪ Basic module ▪ autumn semester ▪ recommended semester: 1

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

Headcount limitations (min-max.): **5 – 300**

Prerequisites: **see in the recommended curricula!**

Topic

Medical Anthropology can shortly be described as a subfield of anthropology that draws upon philosophical, cultural, and biological anthropology to better understand those factors which influence human health and well-being. Within this scope, there are many different theoretical approaches which have contributed to the development of medical anthropology. At least three of these have to receive special mention. First, the ecological approach underlying the interaction between individuals and the biological/cultural environments forms an immediately useful conceptual framework. Second, theory of evolution and adaptation biology, basis of all biological sciences, provides the necessary temporal landscape. Finally, links with the cognitive sciences gives a better insight into the cognitive parameters of illness. With a special focus on the first, the course of medical anthropology covers all relevant approaches of the modern medical anthropology.

Conditions for acceptance of the semester

Attending the lectures.

Making up for missed classes

According to the Code of Studies and Examinations

Reading material

Lecture notes.

Peter J. Brown: Understanding and applying medical anthropology, 1998, Mayfield publishing C., London.

Donald Joralemon: Exploring medical anthropology, 1999, Allyn and Bacon (recommended).

Tony McMichael: Human frontiers, environments and disease, 2001, Cambridge, Univ. Press, (recommended).

Lectures

1. The subfields of Anthropology. The discipline of medical anthropology
2. The levels of human thinking, the essence of human
3. The role of human culture, coping with the environment
4. The complexity of human behaviour.
5. Rationality
6. The evolution of human intelligence
7. Interaction between the environment and the human response-systems.
8. Main adaptation agents I.: Human biocultural adaptation to infectious disease.
9. Main adaptation agents II.: Human nutritional evolution
10. Main adaptation agents III.: Human adaptation to climate
11. Human aging, cross-cultural comparisons
12. Pain perception and its biocultural variability
13. Placebo-Nocebo effect.
14. The basis of human aggression and its variability

Practices

Seminars

Exam topics/questions

www.aok.pte.hu/magtud

OAABI1 BIOPHYSICS 1

Course director: **DR. GÁBOR HILD**, associate professor
Department of Biophysics

4 credit ▪ semester exam ▪ Basic module ▪ autumn semester ▪ recommended semester: 1

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

Headcount limitations (min-max.): **5 – 0**

Prerequisites: **see in the recommended curricula!**

Topic

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

Conditions for acceptance of the semester

Completion and proper documentation of each laboratory practice and approval thereof by the course instructor. Maximum 3 absences from practices. Students are not allowed to be late from the practicals. Being late counts as an absence.

Making up for missed classes

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

Reading material

1. Medical Biophysics (ed. Damjanovich Sándor, Fidy Judit, Szöllősi János). Medicina, Budapest, 2008
2. Biophysics Laboratory Manual, Pécs University Press, Pécs
3. Online materials on departmental website (http://biofizika.aok.pte.hu)

Lectures

1. Molecular basis of muscle function and contraction regulation
2. Structure and mechanics of striated muscle
3. Motor proteins. Cell motility
4. The cytoskeletal system
5. Vision
6. Hearing
7. Sensory receptors
8. The cell membrane. Resting potential, action potential
9. Protein structure and folding
10. Structure and dynamics of macromolecules
11. Biophysics of water
12. Biophysics of circulation. Cardiac biophysics
13. Fluid flow
14. Osmosis
15. Diffusion
16. Thermodynamic potentials
17. Laws of thermodynamics
18. Foundations of thermodynamics
19. Biological effects of radioactive radiation
20. Interaction of radioactive radiation with matter
21. X-rays
22. Structure of the atomic nucleus. Radioativity
23. Electromagnetic spectrum. Light
24. Quantum numbers
25. Structure of the atom
26. Foundations of quantum physics
27. Introduction to Biophysics
28. Structure of the atomic nucleus. Radioativity

Practices

1. Direct Current measurements
2. Alternating Current measurements
3. Electrical conductance
4. Refractometry
5. Spectroscopy and spectrophotometry

6. Polarimetry
7. Viscosity of fluids
8. Surface tension
9. Adsorption and swelling
10. Centrifugation
11. Electrophoresis

Seminars

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

OAABMA PUBLIC HEALTH 1 (THE BASICS OF HEALTH PREVENTION)

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

1 credit ▪ midsemester grade ▪ Basic module ▪ autumn semester ▪ recommended semester: 1

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

Headcount limitations (min-max.): **5 – 0**

Prerequisites: **see in the recommended curricula!**

Topic

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

Conditions for acceptance of the semester

In the 8. semester students have to do a final exam of Public Health, for it they need completed courses, which are the followings: The basics of disease prevention(OAABMA),General epidemiology and demography(OAAAED),Environmental Health(OAAKET), Preventive medicine(OAPNEO), Detailed epidemiology(OAKREP),Occupational hygiene and Occupational medicine(OAKMFO).

Making up for missed classes

Reading material

Coospace

Tompa (editor): Basic Principles of Public health (ISBN: 978 963 9879 13 3)

Maxcy, Rosenau, Last: Public Health and Preventive Medicine, 14th edition, Appleton and Lange (ISBN 0-8385-6185-3)

Holland, Detels, Knox: Oxford Textbook of Public Health, 2th edition, Oxford University Press (ISBN 0-1926-1706-0 (Volume 1), ISBN 0-1926-1707-9 (Volume 2), ISBN 0-1926-1708-7 (Volume 3), ISBN 0-1926-1926-8 (Volumes 1-2-3 together)

Lectures

1. Development of the definition of health. The analysis of factors influencing health
2. Social factors influencing disease developement
3. Health prevention, health promotion
4. Health policy
5. Structure and organization of the health care system
6. Financing, practice of the health care systems
7. Quality assurance in the health care system

Practices

1. Mother and child health
2. Health problems of the youth
3. Health problems of the elderly
4. Special health situation of handicapped persons
5. Special health situation of minorities
6. Rehabilitation, chronic nursing care, hospice
7. Evidence based medicine

Seminars

Exam topics/questions

OAAMB1 MOLECULAR CELL BIOLOGY 1

Course director: **DR. JÓZSEF SZEBERÉNYI**, professor
Department of Medical Biology

6 credit ▪ semester exam ▪ Basic module ▪ autumn semester ▪ recommended semester: 1

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

Headcount limitations (min-max.): **1 – 0**

Prerequisites: **see in the recommended curricula!**

Topic

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

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

Conditions for acceptance of the semester

According to the Code of Studies and Examinations.

Making up for missed classes

Extra lab programs at the end of each practical cycle.

Reading material

Cooper, G.M.: The Cell. A Molecular Approach.

Szeberényi J., Komáromy L. (editors): Molecular Cell Biology Laboratory Manual.

Szeberényi J., Komáromy L.: Molecular Cell Biology Syllabus.

Lectures

1. Educational objectives
2. Comparison of prokaryotic and eukaryotic cells
3. Modern morphological techniques I.
4. Modern morphological techniques II.
5. Methods of molecular biology I.
6. Methods of molecular biology II.
7. Methods of molecular biology III.
8. Methods of molecular biology IV.
9. Methods of molecular biology V.
10. The cell nucleus
11. Genome organisation
12. The chemical composition of chromatin
13. The cell cycle I.
14. The cell cycle II.
15. DNA replication I.
16. DNA replication II.
17. DNA repair
18. Transcription in prokaryotes
19. The synthesis of rRNA in eukaryotes
20. The synthesis of hnRNA in eukaryotes
21. hnRNA processing
22. The pathology of cell nucleus
23. Closing lecture
24. Cytoplasmic organelles: An overview
25. Translation I.
26. Translation II.
27. Translation III.
28. Regulation of gene expression in prokaryotes
29. Regulation of gene expression in eukaryotes I.
30. Regulation of gene expression in eukaryotes II.
31. Rough endoplasmic reticulum
32. Golgi complex. Protein glycosylation and sorting
33. Endocytosis. Vesicular transport

34. Cell defence mechanisms I.: lysosomes, smooth ER
35. Cell defence mechanisms II.: oxygen free radicals, membrane damage
36. Mitochondria I.
37. Mitochondria II.
38. Cytoskeleton I.
39. Cytoskeleton II.
40. The cell membrane
41. Passive transport processes
42. Closing lecture

Practices

1. Light microscopy
2. Light microscopy
3. Separation methods (Centrifugation, chromatography)
4. Separation methods (Centrifugation, chromatography)
5. Separation methods (electrophoresis)
6. Separation methods (electrophoresis)
7. Isolation of DNA and RNA
8. Isolation of DNA and RNA
9. Plasmid isolation
10. Plasmid isolation
11. Restriction mapping
12. Restriction mapping

Seminars

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

Exam topics/questions

1. Proteins
2. Lipids
3. Carbohydrates
4. Nucleosides, nucleotides

5. Comparison of pro- and eukaryotic cells
6. Methods of immunocytochemistry
7. Restriction endonucleases
8. Southern blotting
9. DNA sequencing
10. DNA chips
11. Genomic libraries
12. Polymerase chain reaction
13. Transgenic organisms
14. Targeted inhibition of endogenous gene function
15. cDNA libraries
16. Northern blotting
17. Immunoprecipitation and Western blotting
18. The structure of cell nucleus
19. The organisation of chromatin
20. The structure of DNA
21. DNA, the genetic material
22. Unique and repetitive sequences
23. The chemical composition of chromatin
24. The phases of cell cycle
25. The regulation of cell cycle
26. Mitosis
27. General features of replication
28. The mechanism of replication in prokaryotes
29. Eukaryotic replication
30. DNA repair
31. The mechanism of prokaryotic transcription
32. General features of eukaryotic transcription
33. Synthesis and processing of eukaryotic pre-rRNA
34. Synthesis of pre-mRNA in eukaryotes. Cap-formation and polyadenylation.
35. Pre-mRNA splicing
36. The structure and classes of RNA
37. Synthesis of aminoacyl-tRNA
38. The structure and function of ribosomes
39. The genetic code
40. Initiation of translation
41. Elongation and termination of translation
42. General features of translation
43. The lactose operon
44. The tryptophan operon
45. Levels of regulation of eukaryotic gene expression
46. Eukaryotic transcription factors
47. The mechanism of action of steroid hormones
48. Rough endoplasmic reticulum
49. Golgi complex. Protein glycosylation
50. The mechanism of secretion
51. Endocytosis
52. The mechanism of vesicular transport
53. Lysosomes. Smooth endoplasmic reticulum
54. Oxygen free radicals. Membrane damage. Lipid peroxidation
55. The structure and function of mitochondria
56. The genetic apparatus of mitochondria
57. Mitochondrial diseases

OAAMET BIOMETRICS

Course director: **DR. LÁSZLÓ PÓTÓ**, associate professor
Institute of Bioanalysis

2 credit ▪ semester exam ▪ Basic module ▪ autumn semester ▪ recommended semester: 1

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

Headcount limitations (min-max.): **1 – 0**

Prerequisites: **see in the recommended curricula!**

Topic

As a first course in statistics it covers the following main blocks: Basic data handling and computer use. Exploring data by graphical and numerical characterisation. Basic concepts of probability and statistical inference. The basic methods for statistical inference most frequently used in medicine.

As the main goal it focuses on the power of 'statistical thinking' that is new to students and increasingly important at medical field.

Conditions for acceptance of the semester

Two written test, no more than two missed classes.

There is a three-steps exam for the grade: an entry-test, a problem to be solved by the computer (using SPSS) and a theory question. All the three should be completed at least 'satisfactory' for a succesfull exam.

Making up for missed classes

extra class

Reading material

Issued by the Institute:

J. Belágyi: Medical statistics. Lecture notes, Pécs, 1996.

L. Pótó: Biometrics. Workbook for the practices, Pécs, 2007.

Handouts and worksheets.

Textbooks:

1, Moore, D. S. The Basic Practice of Statistics, 5th Ed., 2010.

or

2, Moore, David S., McCabe, George P. Introduction to the Practice of Statistics 5th Ed, 2005, W.H. Freeman

and:

Yates, Dan, Moore, David S., Starnes, Daren S. The Practice of Statistics (TI-83/89 Graphing Calculator Enhanced) 2/e, 2003, W.H. Freeman

or

3,

Rees, W. G. Essential Statistics, Chapman and Hall, 1992

Lectures

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

Practices

1. Probability examples 1. + Using computers, Windows, SPSS.
2. Probability examples 2 - discrete distributions.
3. The binomial distribution.
4. Exploring data by graphs. Continuous variables. Histogram.

5. Exploring data by numbers - descriptive statistics
6. Normal distribution. The distribution of the sample mean.
7. Estimations. The confidence interval of the expected value.
8. The hypothesis testing - the `five steps`. The one sample (and the paired samples) t tests. The sign test.
9. Estimation and hypothesis testing. The Type one and Type two errors.
10. The independent samples t test.
11. The linear regression and correlation.
12. Contingency tables - the chi-squares test.
13. Nonparametric tests (Sign test, Wilcoxon tests, Mann-Whitney test)
14. Summary

Seminars

Exam topics/questions

1. The main goal of biometrics/biostatistics

Compare the two models - what are the main differences?

Relate them and show how they both have its role in the scientific work and in medicine.

(mainly from the lectures 1, 3, and 6-7-8)

2. The key feature of the statistical thinking - the probability

Show this term - use a simple example, please. When can it be (and when can not) calculated? Illustrate how both way can be used in practical medical situations - by some examples .

(mainly from the lectures 1, 2, 6-7-8 and 12)

3. The idea of the probability distribution - discrete distributions - 1,

Demonstrate on the example of the binomial distribution how the probability calculations (games of chances case) can be used in real life situations. How can you illustrate a distribution (graphically). Trace its role on the decision making.

(mainly from the lectures 2, 6-7-8 and 12)

4. The idea of the probability distribution - discrete distributions - 2,

Contrast the binomial and the Poisson distributions: similarities and differences - demonstrated by some examples. Show the importance of discrete distributions trough examples. (Which hypothesis testing methods are based on this approximation?)

(mainly from the lectures 2, 6-7-8 and 12)

5. The basic principles of statistical thinking - from the data to the decision

The way to the decision - and some pitfalls. (size of the sample, representativity, lurking variables, probability decision, risk of errors, - and handling them)

(mainly from the lectures 3 and 6-7-8)

6. Types of the data (variables) and displaying them with graphs

The three most frequent types of data and the methods for summarizing and displaying them.

Applications of some diagrams - strength and weaknesses. What specific info can be observed from a given type of graph? When to choose a given type?

(mainly from the lecture 3 and 10)

7. The population and the sample

Explain both terms in case of some different types of data. How to characterize (by pictures or numbers) the sample and the population in these examples? Discuss the basic role of both terms in the statistical inference and decision making

(mainly from the lectures 2, 3, 6-7-8 and 12)

8. Numerical description of continuous data

Contrast the ‘five number’ and ‘three number’ descriptions. When to use one and when the other?

Prove and demonstrate by examples the basic role of the two description while selecting the appropriate decision making (or hypothesis testing) method.

(mainly from the lectures 4, 6-7-8 and 12)

9. The idea of the probability distribution - continuous distributions

Symmetrical and skewed distributions. How the measures of the sample show (mirror) the shape of the distribution? Demonstrate them on the example of the normal and some skewed distributions. Prove the importance of distinction between them (think to the condition of the decision making methods).

(mainly from the lectures 4, 6-7-8 and 12)

10. The normal distribution 1

Features. Why is it so frequently used in biology and medicine?

Application examples (reference range, ...).

How does the 'normal approximation' method demonstrate its importance (application examples) ... and how does the conditions of the hypothesis testing methods?

(mainly from the lectures 4, 5, 6-7-8 and 12)

11. The normal distribution 2

How the 'distribution of the mean' shows its importance? Verify the basic role of the 'distribution of the mean' while statistical inference and decision making.

(mainly from the lectures 4, 5, 6-7-8-9-10)

12. Statistical inference

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

(mainly from the lectures 5 and 6)

13. The confidence interval of the population mean

You can find the '95% CI' on most of the SPSS output (that you learned). What is that and why can you meet it so frequently at statistical analysis? Give examples of results screens (methods): why is it included in the given method - what is the use of it there?

(mainly from the lectures 5 and 6 - and all the lectures from then)

14. The basic idea of hypothesis testing

Prove the relevance of the 'five steps' method - and demonstrate it on everyday and medical examples. What are the simple given steps of the 'five' and those that are require personal evaluation from case to case? Discuss these later ones on examples.

(mainly from the lectures 7 - and all the lectures from then)

15. The one sample and the paired t test

At what kind of data (-structure) should you use this method — ; when hypothesis testing? Relate the two methods to each other. What can be done when the application conditions do not fit? Why not use these later methods at all the situations than?

(mainly from the lectures 6-7-8-9 and 12)

16. The confidence interval and the hypothesis testing

Contrast the two methods: similarities and differences - strength and weaknesses.

Demonstrate your evaluation on examples.

(mainly from the lectures 6-7-8)

17. The risk of errors and the power of a test

Discuss the essential feature of the statistical decisions the risk of errors. How can you handle these risks? When should you handle these risks?

Explain on examples: when can you use the value of the risk of a certain error and when to use the power of the test? (Which questions call for this kind of answers?)

(mainly from the lectures 8 and 9)

18. The two (independent) samples t test

Contrast the paired and independent samples t tests? What are the typical questions which call for the later method? What is the specific requirement (condition) of this method - and how can you handle this with the help of the F test?

(What should we 'pay for' that solution? Why not to use always the solution which has less requirements?)

(mainly from the lecture 9)

19. Connection between two variables - continuous variables

Contrast the 'one variable - two samples' and the 'two variables - paired data ('one sample')' cases. What are the typical questions in the two cases?

Use examples to explain the method of the linear regression and correlation analysis. Stress the steps where there is an obvious role of statistical thinking.

Is this method a hypothesis test?

(mainly from the lecture 10)

20. Connection between two variables - categorical variables

Relate to each other the 'two variables' methods for continuous and categorical variables - similarities and differences. Which numbers are to be evaluated in the later case?

Which hypothesis testing method(s) are available for that? Explain the five steps on an example. What are the conditions for applying the method(s) and what to do when those conditions are not valid?

(mainly from the lectures 11 and 12)

21. Evaluation of frequency data - 1.

Why the chi-squares test is not applicable in the medical practice frequently? What to do then? When to use the Fisher's exact test - out of those cases? What the 'exact' word means in the name?

(mainly from the lectures 11 and 12)

22. Evaluation of frequency data - 2.

How to qualify a diagnostic test? Which questions can be answered by the 'sensitivity', 'specificity' and the 'predictive value(s)' of the test?

The confidence interval for the proportion. Explain (using the previous term) why the chi-squares test gives 'not significant' result at evaluations of medical data frequently.

(mainly from the lectures 11 and 12)

23. Nonparametric tests - 1.

When to refuse the application of a t test - and when to apply the sign test instead? Demonstrate the 'five steps' on an example using the sign test. Contrast this method and the appropriate 'parametric' one? What are the strength and weaknesses of this method?

(mainly from the lectures 2, 7 and 12)

24. Nonparametric tests - 2.

When to refuse the application of a t test - and when to apply the Wicoxon and the Mann-Whitney test instead? Demonstrate the application of both test on examples. Contrast these methods and the appropriate 'parametric' ones? What are the strength and weaknesses of these methods?

(mainly from the lectures 2, 9 and 12)

25. The principle of the ANOVA

Demonstrate the application of the ANOVA method on an example

What is the basic idea of the evaluation? Illustrate it on the case of comparing several group means simultaneously.

What is the strength of this method in contrast to the several t tests for pairs of groups?

(mainly from the lectures 2, 8, 9 and 13)

OAAOET BEHAVIORAL SCIENCE 2 (MEDICAL ETHICS)

Course director: **DR. ZSUZSANNA FÜZESI**, associate professor
Department of Behavioural Sciences

1 credit ▪ midsemester grade ▪ Basic module ▪ autumn semester ▪ recommended semester: 1

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

Headcount limitations (min-max.): **5 – 250**

Prerequisites: **see in the recommended curricula!**

Topic

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

Conditions for acceptance of the semester

Attendance, written test

Making up for missed classes

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Reading material

Dr. Erich H. Loewy and Dr. Roberta Springer Loewy, Textbook of Healthcare Ethics, Kluwer Academic Publishers, Dordrecht, 2004.

Biomedical Ethics, edited by Thomas A. Mappes et al, McGraw-Hill Higher Education, 4th edition, 1995.

Lectures

Practices

Seminars

1. The differences between traditional medical ethics and modern bioethics
2. Rationality and ethics
3. The main moral theories
4. The principle of informed consent
5. Problems in the care of the terminally ill
6. Problems in the care of the terminally ill
7. The moral status of abortion
8. Ethical issues concerning transplantation
9. Genethics
10. Genethics
11. Neuroethics
12. Neuroethics
13. Summarizing discussion
14. Written test

Exam topics/questions

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OAAOM1 MEDICAL CHEMISTRY 1

Course director: **DR. TAMÁS LÓRÁND**, associate professor
Department of Biochemistry and Medical Chemistry

6 credit ▪ semester exam ▪ Basic module ▪ autumn semester ▪ recommended semester: 1

Number of hours/semester: **42 lectures + 28 practices + 14 seminars = total of 84 hours**

Headcount limitations (min-max.): **0 – 0**

Prerequisites: **see in the recommended curricula!**

Topic

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

Conditions for acceptance of the semester

Completing two Test Papers reaching minimum 30% as an average.

As regards the lab questions written weekly at the beginning of the practice, students have to write minimum 10 of them and they have to give minimum seven correct answers.

It is obligatory to attend lectures, seminars and practices. Maximum absences: 12 hours altogether.

The students are obliged to attend the General chemistry course. If they fulfilled the requirements of this course, can be sit for an exam of medical chemistry 1.

Making up for missed classes

None.

Reading material

McMurray, Fay: Chemistry (latest edition)

Darrell D. Ebbing (Ed.): General Chemistry(latest edition)

Veronika Nagy (Ed.):Laboratory experiments in medical chemistry (Univ. Med. School of Pécs, 2010)Internet edition.

P. Gergely (Ed.): Organic and bioorganic chemistry for medical students (Univ. Med. School of Debrecen, latest edition)

P. Gergely (Ed.):Introduction to Bioinorganic chemistry for medical students (Univ. Med. School of Debrecen,latest edition)

A. Zeeck: Chemie für Mediziener (latest edition)

Lectures

1. Introduction to Medical Chemistry, connection with medicine.
2. The periodic table. Chemical bonding.
3. Basics of valence bond and molecular orbital theories. Secondary interactions.
4. Basics in inorganic chemistry. I
5. Basics in inorganic chemistry. II
6. Basics in inorganic chemistry. III
7. States of matter, gas laws. Water and aqueous solutions. Dissolution of gases, liquids and solids.
8. Colligative properties of dilute solutions.
9. Chemical equilibrium, mass action law. Heterogeneous equilibria. Solubility product.
10. Acid-base theories. Derivatives of acids, salts, thiocompounds.
11. Electrolytic dissociation. Activity and ionic strength. Classification of electrolytes, degree of dissociation, conductivity.
12. Ion product constant of water, pH, pOH. Acid-base indicators.
13. Hydrolysis of salts.
14. Buffer solutions, physiological buffer systems.
15. Chemical kinetics.
16. Complexes: structure, nomenclature, stability. I
17. Complexes: structure, nomenclature, stability. II
18. Colloids.
19. Thermodynamics, thermochemistry. I
20. Thermodynamics, thermochemistry. II
21. Photochemistry.
22. Electrochemistry. I
23. Electrochemistry. II
24. Introduction to organic chemistry. Structure of carbon compounds, hybridisation of carbon.
25. Stereoelectronic effects. Functional groups, families of organic compounds.
26. Reaction types in organic chemistry.
27. Basics of stereochemisty, types of isomerism.

28. Alkanes, cycloalkanes and conformational isomerism.
29. Alkenes and geometrical isomerism.
30. Alkynes.
31. Aromatic hydrocarbons.
32. Organic halides.
33. Optical isomerism and configuration.
34. Alcohols, phenols. I
35. Alcohols, phenols. II
36. Ethers.
37. Organic thio-compounds.
38. Oxocompounds: aldehydes, ketones, quinones. I
39. Oxocompounds: aldehydes, ketones, quinones. II
40. Carboxylic acids and their derivatives. I
41. Carboxylic acids and their derivatives. II
42. Carboxylic acids and their derivatives. III

Practices

1. Laboratory regulations. Accident and fire protection
2. Demonstration: filtration and separatory funnel.
3. Physical changes, phase transfers. I
4. Physical changes, phase transfers. II
5. Experiments on biologically important non-metals I. (halogenes, oxygen, sulphur)
6. Experiments on biologically important non-metals I (halogenes, oxygen, sulphur)
7. Experiments on biologically important non-metals II (sulphur, nitrogen-group)
8. Experiments on biologically important non-metals II (sulphur, nitrogen-group)
9. Experiments on biologically important non-metals III. (carbon-group)
10. Experiments on biologically important non-metals III. (carbon-group)
11. Experiments on biologically important metals I. (s-block, aluminium)
12. Experiments on biologically important metals I. (s-block, aluminium)
13. Experiments on biologically important metals II. (d-block elements). Dilute solutions. Colloids.
14. Experiments on biologically important metals II. (d-block elements). Dilute solutions. Colloids.
15. Experiments on kinetics and equilibria. Thermochemistry. I
16. Experiments on kinetics and equilibria. Thermochemistry. II
17. Electrochemisty. I
18. Electrochemisty. II
19. Titrations of hydrochloric acid and lactic acid. I
20. Titrations of hydrochloric acid and lactic acid. II
21. Preparation of solutions.
22. Potenciometric titration. Titrations of phosphoric acid.
23. Experiments on buffer solutions. I
24. Experiments on buffer solutions. II
25. Permanganometry. I
26. Permanganometry. II
27. -
28. -

Seminars

1. Basic concepts. Writing equations.
2. Calculations connected to stoichiometry.
3. Oxidation number. Redox and ionic equations. I
4. Concentration of solutions I.
5. Colligative properties. Demonstration: osmometry.
6. Demonstration: Landolt-experiment
7. Electrolytic equilibria, calculation of pH. I
8. Electrolytic equilibria, calculation of pH. Hydolysis of salts. II
9. Buffer solutions. I
10. Buffer solutions. II
11. Solubility product. I
12. Organic chemistry. II
13. Organic chemistry. III

14. Organic chemistry. IV

Exam topics/questions

http://www.pote.hu/index.php?page=egyseg&egy_id=20&nyelv=eng&menu=okt_anyag

OAAAA1 ANATOMY 1

Course director: **DR. MAGDOLNA KOVÁCS**, professor
Department of Anatomy

5 credit ▪ semester exam ▪ Basic module ▪ spring semester ▪ recommended semester: 2

Number of hours/semester: **14 lectures + 56 practices + 0 seminars = total of 70 hours**

Headcount limitations (min-max.): **5 – 200**

Prerequisites: **see in the recommended curricula!**

Topic

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

Conditions for acceptance of the semester

Absences (with any reason) from no more than 15 % of the lectures and practices (11 hours).

Making up for missed classes

Exceptionally, students may attend the practice of another group (on the same week).

Reading material

http://an-server.pote.hu

Lectures

1. Introduction to the Anatomy.
2. General osteology and arthrology
3. The pelvis and the foot. Structures and functions.
4. General myology, angiology and neurology. Introduction to the Regional Anatomy
5. Clinical aspects of the pelvis and lower limb. Imaging techniques.
6. Structure and movements of the thorax and vertebral column.
7. Lymphatic drainage of the limbs and breast. Clinical importance of the primary lymph nodes.
8. Bones and structure of the skull. The neurocranium.
9. Bones and cavities of the viscerocranium
10. Clinical aspects of the trunc and lower limb.
11. Review of the upper limb I.; Joints, muscles and their functions.
12. Review of the upper limb II; Blood and nerve supply. Frequent injuries and their consequences.
13. Review of the lower limb I.; Joints, muscles and their functions.
14. Review of the lower limb II; Blood and nerve supply. Frequent injuries and their consequences.

Practices

1. The knee joint.
2. Terms of position and direction. The main plains.
3. The skeleton and joints of the foot 1.
4. Bones of the arm and forearm 1.
5. Bones of the arm and forearm 2.
6. Bones of the hand.
7. Joints of the shoulder girdle.
8. The shoulder joint.
9. The elbow joint.
10. Joints of the hand 1.
11. Joints of the hand 2.
12. The hip bone and sacrum. The skeleton of pelvis.
13. The lesser pelvis.
14. The femur.
15. Bones of the leg 1.
16. The hip joint.
17. Bones of the shoulder girdle.
18. The skeleton and joints of the foot 2.
19. Bones and joints of the limbs. Recapitulation 1.
20. Bones and joints of the limbs. Recapitulation 2.

21. Topographic anatomy of the ventral aspect of upper and lower limbs. 1.
22. Topographic anatomy of the ventral aspect of upper and lower limbs. 2.
23. Topographic anatomy of the ventral aspect of upper and lower limbs. 3.
24. Topographic anatomy of the ventral aspect of upper and lower limbs. 4.
25. Topographic anatomy of the ventral aspect of limbs.The structure and regions of the abdominal wall 1.
26. Topographic anatomy of the ventral aspect of limbs.The structure and regions of the abdominal wall 2.
27. Topographic anatomy of the ventral aspect of limbs.The structure and regions of the abdominal wall 3.
28. Topographic anatomy of the ventral aspect of limbs.The structure and regions of the abdominal wall 4.
29. Topographic anatomy of the ventral aspect of limbs and abdominal wall 5. The vertebrae, ribs, and thorax 1.
30. Topographic anatomy of the ventral aspect of limbs and abdominal wall 6. The vertebrae, ribs, and thorax 2.
31. Topographic anatomy of the ventral aspect of limbs and abdominal wall 7. The vertebrae, ribs, and thorax 3.
32. Topographic anatomy of the ventral aspect of limbs and abdominal wall 8. The vertebrae, ribs, and thorax 4.
33. Topographic anatomy of the ventral aspect of limbs and abdominal wall 9. Joints of the vertebral column and thorax 1.
34. Topographic anatomy of the ventral aspect of limbs and abdominal wall 10. Joints of the vertebral column and thorax 2.
35. Topographic anatomy of the ventral aspect of limbs and abdominal wall 11. Joints of the vertebral column and thorax 3.
36. Topographic anatomy of the ventral aspect of limbs and abdominal wall 12. Joints of the vertebral column and thorax 4.
37. Topographic anatomy of the ventral aspect of limbs and abdominal wall 13. The skull 1.
38. Topographic anatomy of the ventral aspect of limbs and abdominal wall 14. The skull 2.
39. Topographic anatomy of the ventral aspect of limbs and abdominal wall 15. The skull 3.
40. Topographic anatomy of the ventral aspect of limbs and abdominal wall 16. The skull 4.
41. Topographic anatomy of the dorsal aspect of limbs and abdominal wall 1. The skull 5.
42. Topographic anatomy of the dorsal aspect of limbs and abdominal wall 2. The skull 6.
43. Topographic anatomy of the dorsal aspect of upper and lower limbs 3. The skull 7.
44. Topographic anatomy of the dorsal aspect of upper and lower limbs 4. The skull 8.
45. Topographic anatomy of the dorsal aspect of upper and lower limbs 5. Nuchal region & dorsal muscles of trunc 1. The skull 9.
46. Topographic anatomy of the dorsal aspect of upper and lower limbs 6. Nuchal region & dorsal muscles of trunc 2.The skull 10.
47. Topographic anatomy of the dorsal aspect of upper and lower limbs 7. Nuchal region & dorsal muscles of trunc 3.The skull 11.
48. Topographic anatomy of the dorsal aspect of upper and lower limbs 8. Nuchal region & dorsal muscles of trunc 4. The skull 12.
49. Topographic anatomy of the dorsal aspect of upper and lower limbs 9. Nuchal region & dorsal muscles of trunc 5.The skull 13.
50. Topographic anatomy of the dorsal aspect of upper and lower limbs 10. Nuchal region & dorsal muscles of trunc 6.The skull 14.
51. Topographic anatomy of the dorsal aspect of upper and lower limbs 11. Nuchal region & dorsal muscles of trunc 7.The skull 15.
52. Topographic anatomy of the dorsal aspect of upper and lower limbs 12. Nuchal region & dorsal muscles of trunc 8.The skull 16.
53. Dorsal and ventral regions of the limbs. Recapitulation 1.
54. Dorsal and ventral regions of the limbs. Recapitulation 2.
55. Dorsal and ventral regions of the limbs. Recapitulation 3.
56. Dorsal and ventral regions of the limbs. Recapitulation 4.

Seminars

Exam topics/questions

http://an-server.pote.hu

OAAAED PUBLIC HEALTH 2 (GENERAL EPIDEMIOLOGY AND DEMOGRAPHY)

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

2 credit ▪ semester exam ▪ Basic module ▪ spring semester ▪ recommended semester: 2

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

Headcount limitations (min-max.): **5 – 0**

Prerequisites: **see in the recommended curricula!**

Topic

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

Conditions for acceptance of the semester

In the 8. semester students have to do a final exam of Public Health, for it they need completed courses, which are the followings: The basics of disease prevention (OAABMA), General epidemiology and demography (OAAAED), Environmental Health (OAAKET), Preventive medicine (OAPNEO), Detailed epidemiology (OAKREP), Occupational hygiene and Occupational medicine (OAKMFO).

Making up for missed classes

Reading material

Bonita, Beaglehole, Kjellstro: Basic epidemiology

Lectures

1. History and definition of epidemiology
2. Basics of general epidemiology. Criteria of a causative association
3. Epidemiological terms and indicators.
4. Molecular epidemiology
5. Types and main features of epidemiological studies
6. Analytical epidemiological studies I. (cross-sectional and retrospective studies)
7. Analytical epidemiological studies II. (prospective studies)
8. Experimental epidemiological studies
9. Clinical epidemiology
10. Basic terms of demography. The structure of a population
11. Temporal changes in the structure of a population
12. Factors affecting the population structure
13. Main demographical characteristics of developing and developed countries
14. Demographical characteristics of Hungary

Practices

1. Design of epidemiological studies
2. Direct and indirect standardization
3. Practical issues concerning epidemiological studies. Data collection and entry. (Epi Info I.)
4. Analysis and evaluation of epidemiological data (Epi Info II.)
5. Evaluation of clinical epidemiological studies (Epi Info III.)
6. Bias and confounding (Epi Info IV.)
7. Geographical information systems

Seminars

Exam topics/questions

OAABI2 BIOPHYSICS 2

Course director: **DR. GÁBOR HILD**, associate professor
Department of Biophysics

3 credit ▪ final exam ▪ Basic module ▪ spring semester ▪ recommended semester: 2

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

Headcount limitations (min-max.): **5 – 0**

Prerequisites: **see in the recommended curricula!**

Topic

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

Conditions for acceptance of the semester

Completion and proper documentation of each laboratory practice and approval thereof by the course instructor. Maximum 3 absences from practices. Students are not allowed to be late from the practicals. Being late counts as an absence.

Making up for missed classes

Missed practices can be made up during make-up opportunities provided by the department. During each make-up lab, only one missed practice can be made up.

Reading material

1. Medical Biophysics (ed. Damjanovich Sándor, Fidy Judit, Szöllősi János). Medicina, Budapest, 2008
2. Biophysics Laboratory Maual, Pécs University Press, Pécs
3. Online materials on departmental website (http://biofizika.aok.pte.hu)

Lectures

1. Absorption photometry
2. Fluorescence spectroscopy
3. Fluorescence polarization. FRAP
4. FRET. Fluorescene quenching
5. X-ray diffraction
6. Transient kinetic methods
7. Modern microscopic methods
8. Sedimentation, electrophoresis
9. Infrared, Raman and CD spectroscopy
10. ESR, NMR
11. Flow cytometry
12. Ultrasound
13. CT, MRI
14. Gamma-camera, SPECT, PET

Practices

1. The Geiger-Müller counter
2. Radioactive half-life
3. Gamma-absorption and spectrometry
4. Absorption of beta-radiation, dead time
5. Scintigraphy
6. Optics
7. Absorption photometry
8. Blood pressure
9. Electrocardiography (EKG)
10. Ultrasound
11. Temperature measurement
12. Polarimetry
13. Illumination

Seminars

Exam topics/questions

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

OAAMB2 MOLECULAR CELL BIOLOGY 2

Course director: **DR. JÓZSEF SZEBERÉNYI**, professor
Department of Medical Biology

4 credit ▪ final exam ▪ Basic module ▪ spring semester ▪ recommended semester: 2

Number of hours/semester: **28 lectures + 12 practices + 16 seminars = total of 56 hours**

Headcount limitations (min-max.): **1 – 0**

Prerequisites: **see in the recommended curricula!**

Topic

To provide molecular and cellular biological basis for the teaching of anatomy, biochemistry, physiology, pathology, pathophysiology, microbiology and pharmacology. To teach students molecular cell biology facts essential for clinical subjects. Main topics: cell membrane and extracellular matrix; intracellular signal transduction; cellular and molecular mechanisms of carcinogenesis; introduction to medical genetics; molecular medicine.

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

Conditions for acceptance of the semester

According to the Code of Studies and Examinations.

Making up for missed classes

Extra lab programs at the end of each practical cycle.

Reading material

Cooper, G.M.: The Cell. A Molecular Approach.

Szeberényi, J., Komáromy, L. (editors): Molecular Cell Biology Laboratory Manual

Szeberényi, J., Komáromy, L.: Molecular Cell Biology Syllabus

Lectures

1. Opening lecture
2. Active transport processes
3. Extracellular matrix
4. Signal transduction mechanisms I.
5. Signal transduction mechanisms II.
6. Signal transduction mechanisms III.
7. Signal transduction mechanisms IV.
8. Signal transduction mechanisms V.
9. The molecular basis of development
10. Apoptosis
11. The tumour cell
12. DNA tumour viruses
13. RNA tumour viruses
14. Retroviral oncogenes
15. Cellular oncogenes I.
16. Cellular oncogenes II.
17. Cellular oncogenes III.
18. Tumour suppresser genes I.
19. Tumour suppressor genes II.
20. Oncogenes and the cell cycle
21. The multistage mechanism of carcinogenesis
22. Closing lecture
23. Cytogenetics I.
24. Cytogenetics II.
25. Types of inheritance
26. Molecular diagnostics
27. Gene therapy
28. Closing lecture

Practices

1. Histochemistry of nucleic acids
2. Histochemistry of nucleic acids
3. Phase contrast microscopy. Polarisation micros
4. Phase contrast microscopy. Polarisation microscopy
5. Histochemistry of the cytoplasm

6. Histochemistry of the cytoplasm
7. Permeability
8. Permeability
9. Signal transduction. The tumour cell
10. Signal transduction. The tumour cell
11. ntroduction to clinical genetics
12. Introduction to clinical genetics

Seminars

1. Cytoskeleton.
2. Membrane
3. Transport. Extracellular matrix. Signal transduction mechanisms.
4. Types of chemical signalling. Receptors. The cAMP pathway.
5. TEST: Cytoskeleton. Membrane, transport, extracellular matrix. Chemical signalling. Receptors. The cAMP pathway
6. Signal transduction mechanisms: the phospholipase C pathway. Growth factor and cytokine signalling
7. TEST: Phospholipase C. Growth factor, stress, integrin and cytokine signalling. General features of signalling.
8. Developmental biology. Apoptosis. The tumour cell.
9. Tumour viruses
10. Retroviral oncogenes. Cellular oncogenes
11. TEST: Developmental biology. Apoptosis. Tumour cell. Tumour viruses. Retroviral and cellular oncogenes
12. Tumour suppresser genes. Oncogenes and the cell cycle (odd numbered groups)
13. The multistage mechanism of carcinogenesis. Cytogenetics.
14. Types of inheritance. Molecular medicine
15. SEMESTER TEST
16. SEMESTER TEST

Exam topics/questions

Theoretical examination questions

1. Proteins
2. Lipids
3. Carbohydrates
4. Nucleosides, nucleotides
5. Comparison of pro- and eukaryotic cells
6. Methods of immunocytochemistry
7. Restriction endonucleases
8. Southern blotting
9. DNA sequencing
10. DNA chips
11. Genomic libraries
12. Polymerase chain reaction
13. Transgenic organisms
14. Targeted inhibition of endogenous gene function
15. cDNA libraries
16. Northern blotting
17. Immunoprecipitation and Western blotting
18. The structure of cell nucleus
19. The organisation of chromatin
20. The structure of DNA
21. DNA, the genetic material
22. Unique and repetitive sequences
23. The chemical composition of chromatin
24. The phases of cell cycle
25. The regulation of cell cycle
26. Mitosis
27. General features of replication
28. The mechanism of replication in prokaryotes
29. Eukaryotic replication
30. DNA repair
31. The mechanism of prokaryotic transcription
32. General features of eukaryotic transcription

33. Synthesis and processing of eukaryotic pre-rRNA
34. Synthesis of pre-mRNA in eukaryotes. Cap formation and polyadenylation
35. Pre-mRNA splicing
36. The structure and classes of RNA
37. Synthesis of aminoacyl-tRNA
38. The structure and function of ribosomes
39. The genetic code
40. Initiation of translation
41. Elongation and termination of translation
42. General features of translation
43. The lactose operon
44. The tryptophan operon
45. Levels of regulation of eukaryotic gene expression
46. Eukaryotic transcription factors
47. The mechanism of action of steroid hormones
48. Rough endoplasmic reticulum
49. Golgi complex. Protein glycosylation
50. The mechanism of secretion
51. Endocytosis
52. The mechanism of vesicular transport
53. Lysosomes. Smooth endoplasmic reticulum
54. Oxygen free radicals. Membrane damage. Lipid peroxidation
55. The structure and function of mitochondria
56. The genetic apparatus of mitochondria
57. Mitochondrial diseases
58. Microtubules
59. Microfilaments
60. Intermediate filaments
61. The cell membrane
62. Cell junctions
63. Passive transport
64. Active transport
65. The extracellular matrix
66. Cell-matrix connections
67. Types of chemical signalling
68. cAMP-mediated signal transduction
69. Phospholipid-derived second messengers
70. Growth factor signalling
71. The role of protein kinases in cell regulation
72. Cytokine signalling. Stress signalling
73. General features of signal transduction
74. Molecular basis of development
75. The physiological and pathological role of apoptosis
76. The mechanism of apoptosis
77. General features of the tumour cell
78. Oncogenic DNA viruses
79. Retroviruses
80. Retroviral oncogenes
81. Identification of cellular oncogenes by gene transfer
82. Oncogenesis by weakly transforming retroviruses
83. Mechanisms of cellular oncogene activation
84. General features of tumour suppressor genes
85. Rb and p53 proteins
86. The role of tumour suppressor genes in Wilms tumour, neurofibromatosis, colon and breast cancer
87. The role of oncogenes in cell cycle regulation
88. The multistage mechanism of carcinogenesis
89. Meiosis
90. Autosomal chromosome abnormalities
91. Sex chromosome abnormalities

92. Autosomal inheritance of diseases
93. Sex-linked inheritance of diseases
94. Molecular diagnosis of inherited diseases
95. Molecular diagnosis of tumours and infectious diseases
96. Methods of gene transfer
97. Human gene therapy.

Laboratory examination questions

1. Structure and operation of the light microscope
2. Structure and operation of the electron microscope
3. Sample preparation and contrasting methods for light- and electron microscopy
4. Radioactive isotopes in molecular cell biology
5. Homogenisation, cell fractionation
6. Hypopicnic and isopicnic gradient centrifugation
7. Gel filtration
8. Ion exchange and affinity chromatography
9. Protein electrophoresis
10. Nucleic acid electrophoresis
11. Isolation of mammalian DNA
12. Isolation of mammalian RNA
13. Plasmids, plasmid isolation
14. Histochemistry of nucleic acids
15. Histochemistry of the cytoplasm
16. Phase-contrast microscope
17. Polarisation microscope
18. Enzyme histochemistry and immunohistochemistry
19. Plasmolysis and haemolysis
20. Methods of cytogenetics
21. Observation of prokaryotic cells by immersion objective
22. Determination of cell diameter by light microscope
23. Separation of starch and Cl- by gel filtration - analysis of the diagram
24. Operation of the photometer - determination of DNA and RNA concentration
25. Analysis of protein gels and Western blots
26. Analysis of histochemistric preparations - cytoplasm
27. Identification of nuclear components on electron microscopic pictures
28. Analysis of agarose gels after plasmid electrophoresis and restriction mapping
29. Analysis of histochemistric preparations - nucleic acids
30. Operation of the polarising microscope
31. Centring adjustment and operation of the phase-contrast microscope
32. Identification of cytoplasmic organelles on electron microscopic pictures
33. Lymph node from Burkitt lymphoma - identification of mitotic figures
34. Analysis of light microscopic autoradiographic preparation
35. Identification of normal and cancer cells on PAP-smears
36. Identification of inheritance patterns on pedigrees
37. Analysis of chromosomal abnormalities
38. Observations of immunohistochemichal preparations
39. Identification of undifferentiated, differentiated and apoptotic PC12 cells
40. Analysis of chromosome preparations

OAAOK2 MEDICAL CHEMISTRY 2

Course director: **DR. TAMÁS LÓRÁND**, associate professor
Department of Biochemistry and Medical Chemistry

4 credit ▪ final exam ▪ Basic module ▪ spring semester ▪ recommended semester: 2

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

Headcount limitations (min-max.): **1 – 250**

Prerequisites: **see in the recommended curricula!**

Topic

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

Conditions for acceptance of the semester

Completing two Test Papers reaching minimum 30% as an average.

As regards the lab questions written weekly at the beginning of the practice, students have to write minimum 10 of them and they have to give minimum seven correct answers.

It is obligatory to attend lectures, seminars and practices. Maximum absences: 8 hours altogether.

Making up for missed classes

None.

Reading material

McMurray, Fay: Chemistry (latest edition)

Darrell D. Ebbing (Ed.): General Chemistry(latest edition)

Veronika Nagy (Ed.):Laboratory experiments in medical chemistry (Univ. Med. School of Pécs, 2010)Internet edition.

P. Gergely (Ed.): Organic and bioorganic chemistry for medical students (Univ. Med. School of Debrecen, latest edition)

P. Gergely (Ed.):Introduction to Bioinorganic chemistry for medical students (Univ. Med. School of Debrecen,latest edition)

A. Zeeck: Chemie für Mediziener (latest edition)

Lectures

1. Nitrogen-containing organic compounds.I
2. Nitrogen-containing organic compounds.II
3. Aromatic heterocyclic rings, porphyrines. I
4. Aromatic heterocyclic rings, porphyrines.II
5. Amino acids, peptides. Structure and classification of proteins. I
6. Amino acids, peptides. Structure and classification of proteins. II
7. Carbohydrates: classification and stereochemistry of monosaccharides. Oligosaccharides. I
8. Carbohydrates: classification and stereochemistry of monosaccharides. Oligosaccharides. II
9. Polysaccharides.
10. Lipids: triglicerides.
11. Phospholipids. Structure of the cell membrane.I
12. Phospholipids. Structure of the cell membrane. II
13. Test paper I. Terpenoids, carotenoids.
14. Prostaglandines.
15. Steroids, steroid hormones, bile acids. I
16. Steroids, steroid hormones, bile acids. II
17. Pyrimidine and purine bases. Nucleosides, nucleotides. Nucleic acids: primary and secondary structure.I
18. Pyrimidine and purine bases. Nucleosides, nucleotides. Nucleic acids: primary and secondary structure. II
19. Coenzymes, vitamins. I
20. Coenzymes, vitamins. II
21. Alkaloids and drugs. I
22. Alkaloids and drugs. II
23. Introduction to bioinorganic chemistry.
24. Essential elements. Elements in biological systems.
25. Test paper II. Biological role of alkali and alkaline earth metals.
26. Biochemistry of heavy metals.
27. Bioinorganic chemistry of aluminium, silicon, nitrogen, phosphorus, oxygen, selenium and halogens.I

28. Bioinorganic chemistry of aluminium, silicon, nitrogen, phosphorus, oxygen, selenium and halogens. II

Practices

1. Laboratory operations I. Demonstration: freeze-drying, distillation, evaporation.
2. Laboratory operations I. Demonstration: freeze-drying, distillation, evaporation.
3. Laboratory operations II. Recrystallisation of acetanilide. Demonstration: Soxhlet extraction.
4. Laboratory operations II. Recrystallisation of acetanilide. Demonstration: Soxhlet extraction.
5. Laboratory operations III. Isolation of caffein from tea.
6. Laboratory operations III. Isolation of caffein from tea.
7. Manifestation of secondary interactions in the physical properties of organic compounds. Analysis of organic compounds. Reactions of functional groups I.
8. Manifestation of secondary interactions in the physical properties of organic compounds. Analysis of organic compounds. Reactions of functional groups I.
9. Reactions of functional groups II.
10. Reactions of functional groups II.
11. Reactions of functional groups III.
12. Reactions of functional groups III.
13. Test paper I. Glass technology. Chromatography I.
14. Glass technology. Chromatography I.
15. Chromatography II. Demonstration: ion exchange.
16. Chromatography II. Demonstration: ion exchange.
17. Chromatography III.
18. Chromatography III.
19. Reactions of bioorganic compounds I.
20. Reactions of bioorganic compounds I.
21. Reactions of bioorganic compounds II.
22. Reactions of bioorganic compounds II.
23. Complexes I.
24. Complexes I.
25. Test paper II. Complexes II.
26. Complexes II.
27. -
28. -

Seminars

Exam topics/questions

http://www.pote.hu/index.php?page=egyseg&egy_id=20&nyelv=eng&menu=okt_anyag

OAAOKG MEDICAL COMMUNICATION SKILLS

Course director: **DR. LAJOS NAGY**, professor
Family Medicine Inst.

1 credit ▪ midsemester grade ▪ Basic module ▪ spring semester ▪ recommended semester: 2

Number of hours/semester: **6 lectures + 8 practices + 0 seminars = total of 14 hours**

Headcount limitations (min-max.): **5 – 200**

Prerequisites: **see in the recommended curricula!**

Topic

The basics of doctor-patient encounter. Verbal and non-verbal communication. Ethical issues. How to make an interview. Communication skills training.

Conditions for acceptance of the semester

Missing more than 20% of the program means that the course will not be accepted.
Written exam during the last week of the semester

Making up for missed classes

Reading material

R. McWhinney: A textbook of Family Medicine 2nd edition
Oxford University Press, 1997

R. B. Tayor:Fundamentals of Family Medicine, 2nd edition
Springer, 1998

Allen Pease: Baby Language

Lectures

1. Introduction to Physician-Patient Communication, Doctor-Patient Encounter
2. Interviewing patients
3. Verbal and Non Verbal Communcation I.
4. Verbal and Non Verbal Communcation II.
5. Difficult situations in Communication
6. Breaking Bad News

Practices

1. Breaking Bad news
2. Difficult patients-difficult situations
3. Non verbal communication
4. The training is held by well-trained family physicians
5. Introduction-Getting to know each other
6. Non verbal communication
7. Difficult patients-difficult situations
8. Breaking Bad news

Seminars

Exam topics/questions

OAASF1 HISTOLOGY AND EMBRYOLOGY 1

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

4 credit ▪ semester exam ▪ Basic module ▪ spring semester ▪ recommended semester: 2

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

Headcount limitations (min-max.): **5 – 300**

Prerequisites: **see in the recommended curricula!**

Topic

Basic histology (tissues). Basic embryology (embryogenesis). Microscopic and ultrastructural composition of the basic tissues. Early development of the human body, embryogenesis, external appearance of the fetus. This is the first part of a two-semester subject.

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

Conditions for acceptance of the semester

Students must make proper records with drawings in the classes. Acceptance of the records by the instructor of the group is a prerequisite for getting the signature at the end of the semester.

Absences (with any reason) from no more than 15 % of the lectures and classes (max. 8x45 min = e.g. 4 weekly practices, or 3 practices and 2 lectures, etc.).

Making up for missed classes

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

Reading material

http://an-server.pote.hu

Lectures

1. Introduction to histology. Microscopic techniques. Basic tissue types.
2. The epithelial tissues.
3. Surface epithelia
4. Glandular epithelia
5. Connective tissue cells
6. Fibers and the ground substance of the connective tissue.
7. Types of the connective and supportive tissues.
8. Histology of the cartilages
9. Bone tissues. Intra-membranous bone formation
10. Intracartilaginous bone formation
11. The muscle tissues 1
12. The muscle tissues 2
13. Blood cells
14. Haemopoiesis
15. Histology of blood vessels
16. Nerve tissue 1
17. Nerve tissue 2
18. Review of the basic tissues
19. Progenesis I.
20. Progenesis II.
21. Fertilization, segmentation. Homebox genes.
22. Blastocyst formation, implantation.
23. Gastrulation and neurulation. Determination of the body axes
24. Segmentation of the mesoderm, development of the muscular system
25. Flexion of the embryo. The umbilical cord
26. Fetal membranes, decidua, placenta
27. The external appearance of the embryo. Development of the skull.
28. Malformations and twinnings.

Practices

1. Basic histological techniques. Use of the microscope.
2. --
3. Simple epithelia
4. --
5. Columnar epithelia

6. --
7. Stratified epithelia, transitional epithelium, pigmented epithelium
8. --
9. Glandular epithelia
10. --
11. Cells and fibers of the connective tissue
12. --
13. Types of the connective tissues.
14. --
15. Histology of the cartilage and the bone
16. --
17. Bone formation
18. --
19. Histology of the muscle tissues
20. --
21. Nerve tissue
22. --
23. Blood cells. Haemopoiesis
24. --
25. Histology of the blood vessels.
26. --
27. Embryology seminar
28. --

Seminars

Exam topics/questions

http://an-server.pote.hu

OAAAA2 ANATOMY 2

Course director: **DR. MAGDOLNA KOVÁCS**, professor
Department of Anatomy

5 credit ▪ semester exam ▪ Basic module ▪ autumn semester ▪ recommended semester: 3

Number of hours/semester: **14 lectures + 56 practices + 0 seminars = total of 70 hours**

Headcount limitations (min-max.): **5 – 200**

Prerequisites: **see in the recommended curricula!**

Topic

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

Conditions for acceptance of the semester

Absences (with any reason) from no more than 15 % of the lectures and practices (11 hours).

Making up for missed classes

Exceptionally, students may attend the practice of another group (on the same week).

Reading material

http://an-server.pote.hu

Lectures

1. Oral cavity: tongue, teeth, oropharyngeal isthmus. Pharynx
2. Respiratory system. Larynx and phonation.
3. Lungs and pleura. Anatomy of breathing.
4. Gross anatomy of the heart, cardiac cavities and valves.
5. Vascular supply and conducting system of the heart. Clinical considerations.
6. Topography of the abdominal cavity. Peritoneum. Gastrointestinal tract.
7. Topography and vascular supply of the liver and spleen. Biliary tree.
8. Retroperitoneum. Topography and parts of the pancreas.
9. Topography, section and structure of the kidneys
10. Gross anatomy of the female reproductive system.
11. Gross anatomy of the male reproductive system.
12. Muscles and fasciae of the pelvic floor. Perineum.
13. Obstetrical and gynecological correlates of the genital organs and perineum
14. Vascular supply and lymphatic drainage of the gastrointestinal tract. The vascular anastomoses and their clinical importance.

Practices

1. Oral cavity and teeth 1.
2. Oral cavity and teeth 1.
3. Nasal cavity 1.
4. Nasal cavity 2.
5. Pharynx; Retro- and parapharyngeal spaces 1.
6. Pharynx; Retro- and parapharyngeal spaces 2.
7. Larynx 1.
8. Larynx 2.
9. Structure of the chest wall. Intercostal nerves and vessels 1.
10. Structure of the chest wall. Intercostal nerves and vessels 2.
11. Surface projections and topography of the intrathoracic viscera 1.
12. Surface projections and topography of the intrathoracic viscera 2.
13. Term and division of the mediastinum.
14. Anterior mediastinum 1.
15. Anterior mediastinum 2.
16. The heart. Topography and X-ray picture.
17. Cavities, valves and vascular supply of the heart 1.
18. Cavities, valves and vascular supply of the heart 2.
19. Lungs and bronchi 1.
20. Lungs and bronchi 2.
21. Posterior mediastinum 1.

22. Posterior mediastinum 2.
23. Posterior mediastinum 3.
24. Posterior mediastinum 4.
25. Structure of the abdominal wall (repetition).
26. Regions of the abdominal cavity. Surface projections of the intraabdominal viscera.
27. Hepatoduodenal ligament 1.
28. Hepatoduodenal ligament 2.
29. Coeliac trunk.
30. Topography, vascular supply and lymphatic drainage of the stomach.
31. Topography, vascular supply and lymphatic drainage of duodenum and spleen.
32. Topography, surfaces, and peritoneal relations of liver.
33. Topography and vascular supply of pancreas 1.
34. Topography and vascular supply of pancreas 2.
35. Vascular supply and lymphatic drainage of the small and large intestines 1.
36. Vascular supply and lymphatic drainage of the small and large intestines 2.
37. Topograpy of kidneys.
38. Section of the kidney.
39. Removal of the bowels 1.
40. Removal of the bowels 2.
41. Retroperitoneum.
42. Paired branches of the abdominal aorta.
43. Lumbar plexus.
44. Diaphragm.
45. Topography of the true pelvis.
46. Branches of the internal iliac artery. Sacral plexus.
47. Male and female reproductive organs 1.
48. Male and female reproductive organs 2.
49. Median sagittal sections of the male and female pelvis 1.
50. Median sagittal sections of the male and female pelvis 2.
51. Perineum, external genital organs 1.
52. Perineum, external genital organs 2.
53. Recapitulation 1.
54. Recapitulation 2.
55. Recapitulation 3.
56. Recapitulation 4.

Seminars

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

OAABK1 BIOCHEMISTRY 1

Course director: **GALLYAS FERENC DR. JR.**, professor
Department of Biochemistry and Medical Chemistry

5 credit ▪ semester exam ▪ Basic module ▪ autumn semester ▪ recommended semester: 3

Number of hours/semester: **42 lectures + 28 practices + 0 seminars = total of 70 hours**

Headcount limitations (min-max.): **5 – 0**

Prerequisites: **see in the recommended curricula!**

Topic

The subject covers the principles of chemical/biochemical processes occurring in living organisms.

The 1st semester of the 2-semester Biochemistry course deals with the fundamental metabolic processes and with the function, structure and regulation of the enzymes, transporters and other proteins which participate in the above mentioned processes. The subject reveals the physical, chemical, thermodynamical and reaction-kinetical laws and rules of the essential metabolic processes and describes the structural characteristics of the participating small molecules.

The subject lies down the foundations of the subjects Biochemistry 2, Pharmacology and Clinical Chemistry.

Conditions for acceptance of the semester

It is mandatory to attend the lectures and laboratory practices.

Requirements of the acceptance of Biochemistry 1 course are the following:

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

Making up for missed classes

Permission should be asked from the course director to do the practice with an other group. Permission will be given maximum 2 times.

Reading material

Nelson - Cox: Lehninger Principles of Biochemistry, 5th Ed, W.H. Freeman, 2008.

Berg - Tymoczko - Stryer: Biochemistry, 6th Ed, W.H. Freeman, 2007.

Devlin: Textbook of Biochemistry with Clinical Correlations, 6th Ed, Wiley-Liss, 2006

Experimental Biochemistry
Edited by Dénes Szabó, 1990

Lectures

1. —Structure and function of proteins, peptides
2. Folding, the role of chaperons
3. Energetics
4. Basics of enzymatic catalysis (Farkas Viktória)
5. Regulation of enzymes, isoenzymes
6. Hemoglobin, oxygen transport
7. Proteins of the immune system
8. Glycolysis I. (Farkas Viktória)
9. Glycolysis II. (Farkas Viktória)
10. Metabolic pathways coupled to the glycolysis (Veres Balázs)
11. Characterization of lipids, biological membranes (Veres Balázs)
12. Fatty acid oxidation (Veres Balázs)
13. The pyruvate dehydrogenase complex (PDC)
14. Reactions of the citric acid cycle
15. Regulation of the citric acid cycle
16. Respiratory chain and its inhibition
17. ATP synthesis
18. Mitochondrial transport processes, shuttles (Veres Balázs)
19. Supramolecular organization of functionally related enzymes
20. Reactive oxygen species (ROS)
21. Photosynthesis, light reaction (Veres Balázs)

22. Gluconeogenesis in plant cells from CO2 (dark reaction) and from acetate (Veres Balázs)
23. Gluconeogenesis in animal cells
24. Pentose phosphate cycle (Farkas Viktória)
25. Monosaccharides, disaccharides, UDP mechanisms (Veres Balázs)
26. Glycogen synthesis and degradation
27. Concerted regulation of glycogen synthesis and degradation
28. Fatty acid (palmitic acid) synthesis
29. Elongation and desaturation of fatty acids, formation of biologically active molecules
30. Synthesis of complex lipids
31. Synthesis of cholesterol and ketone bodies
32. Regulation and disorders of lipid metabolism
33. Regulation and disorders of carbohydrate metabolism
34. Amino acid metabolism; the fate of the amino group (Debreceni Balázs)
35. Urea cycle (Debreceni Balázs)
36. Amino acid metabolism; the carbon skeleton (Debreceni Balázs)
37. Synthesis of non-essential amino acids (Debreceni Balázs)
38. Enzymopathies of amino acid metabolism (Debreceni Balázs)
39. Synthesis of biologically active molecules from amino acids (Debreceni Balázs)
40. Synthesis of purine and pyrimidine bases and nucleotides (Farkas Viktória)
41. Degradation of purine and pyrimidine bases and nucleotides (Farkas Viktória)
42. Overview of metabolism

Practices

1. Preparation of buffer solutions
2. Preparation of buffer solutions
3. Properties of the proteins
4. Properties of the proteins
5. Determination of protein concentration (Biuret method)
6. Determination of protein concentration (Biuret method)
7. Basic biochemical laboratory techniques
8. Basic biochemical laboratory techniques
9. Exploration of the contents of a cell, subcellular fractionation
10. Exploration of the contents of a cell, subcellular fractionation
11. Cell cultures
12. Cell cultures
13. Polyacrylamide gel electrophoresis, Western Blot
14. Polyacrylamide gel electrophoresis, Western Blot
15. Heart perfusion
16. Heart perfusion
17. SH-Enzymes, Warburg`s optical test
18. SH-Enzymes, Warburg`s optical test
19. Study of the mitochondrial respiration (Clark electrode)
20. Study of the mitochondrial respiration (Clark electrode)
21. Enzyme kinetics, study of enzymatic inhibition
22. Enzyme kinetics, study of enzymatic inhibition
23. Noninvasive biochemical analysis
24. Noninvasive biochemical analysis
25. Affinity chromatography, study of Complex I
26. Affinity chromatography, study of Complex I
27. Consultation
28. Consultation

Seminars

Exam topics/questions

The list of topics of the exam questions are identical to the list of the lectures.

The exams, including the retaken exams are written exams of 30 open questions. Failure to answer more than two of the first 7 questions will automatically result in ‘failed’ grade.

OAAEL1 PHYSIOLOGY 1

Course director: **DR. ZOLTÁN KARÁDI**, professor
Department of Physiology

9 credit ▪ semester exam ▪ Basic module ▪ autumn semester ▪ recommended semester: 3

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

Headcount limitations (min-max.): **5 – 0**

Prerequisites: **see in the recommended curricula!**

Topic

The student has to know the functions and functional mechanisms of the organs, organ systems and the human body as a whole.

The student is required to understand and present

- the regulatory mechanisms of different physiological functions of the human body,
- the regulation of the integrated functions of the individual organs and organ systems,
- and the interrelationships among different control mechanisms in the human body including all the relevant chemical, biochemical, biological and anatomical data.

Conditions for acceptance of the semester

According to the Bylaws of the University of Pécs, Medical School (Code of Studies and Examinations), students are required to attend the lectures and practical classes. Students are required to perform the prescribed practical excercises and to keep a record of them. Missed classes must be made up.

Students are required to give account of their theoretical and practical knowledge during the semester. Exams can be taken only after fulfilling the above prerequisits.

The result of the exam will be based on the combined results of the mid-term tests and the exam performance.

Making up for missed classes

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

Reading material

W.F. Ganong: Review of Medical Physiology

Appleton and Lange, Lange Medical Publications, 1990-2006

A.C. Guyton: Textbook of Medical Physiology

W.B. Saunders Company, 1996-2006

J.B. West (ed.): Best and Taylor's Physiological Basis of Medical Practice

Williams and Wilkins, 1990-1998

Fonyó: Principles of Medical Physiology, Medicina Kiadó 2002

Physiology exercises

Laboratory exercises in physiology 1st Semester

Lectures

1. Introduction. The concept of homeostasis
2. Fluid distribution in the body. The blood
3. Blood constituents
4. Structure and metabolism of haemoglobin. Metabolism of iron
5. Mechanism of blood coagulation
6. Leukocytes I
7. Leukocytes II
8. AB0 blood groups
9. Rh blood groups
10. The cardiac cycle. Generators and conductors of impulses in the heart
11. Mechanical activity of the heart
12. Electrocardiogram I.
13. Electrocardiogram II.
14. Heart sounds. Phonocardiography
15. Cardiac output and cardiac work
16. Distribution of blood volume, pressure flow and resistance
17. Blood pressure. Arterial pulse
18. Circulation through the capillaries
19. Circulation in the veins. Determinants of venous pressure
20. The formation, pressure and flow of lymph
21. Pulmonary circulation, cerebral circulation.

22. Circulation through skin and skeletal muscle. Splanchnic circulation
23. Neural and humoral regulatory mechanisms of the cardiovascular system
24. Homeostatic regulation of the cardiovascular system
25. Mechanics of respiration
26. Intrathoracic pressure. Compliance. Respiratory volumes. Dead spaces
27. Gaseous exchange in the lungs and tissues
28. O2 and CO2 transport mechanism and pH regulation
29. Chemical control of respiration
30. Neural regulatory mechanisms of respiration
31. Mechanisms of acclimatisation
32. The gastrointestinal tract. Function and control of salivary secretion
33. The stomach. Gastric secretion
34. Duodenal processes. Biliary secretion
35. Secretion and absorption in the small intestine
36. Secretion and absorption in the large intestine. Formation of the faeces
37. Humoral and neural control of the gastrointestinal system
38. Digestion and absorption of different nutrients
39. Vitamins
40. Liver functions I
41. Liver functions II
42. Dynamics of glomerular filtration. Plasma clearance
43. Renal blood flow. Extraction ratio. Filtration fraction
44. Renal circulation
45. The renin-angiotensin system
46. Tubular processes
47. Concentrating and diluting mechanisms
48. Fluid volume regulation of the body
49. The mechanisms of urination
50. Acid-base regulation I
51. Acid-base regulation II
52. Energy balance. Metabolism
53. Nutrition
54. Body temperature of man. Hyperthermia, fever
55. Peripheral control of body temperature
56. Central control mechanisms of body temperature
57. The hypothalamo-hypophyseal system
58. Anterior pituitary hormones
59. Cellular mechanisms of hormone action I
60. Cellular mechanisms of hormone action II
61. Hormonal regulation of female sexual functions
62. Pregnancy
63. Lactation
64. Hormonal regulation of male sexual function
65. Erection, ejaculation, coitus
66. Humoral and central neural control of sexual behaviour
67. Puberty. Climacteric
68. Thyroid physiology I.
69. Thyroid physiology II.
70. Functions of posterior lobe of pituitary gland

Practices

1. Getting acquainted with the laboratory. General information, schedules. Personal- and equipment safety rules. Animal care regulations.
2. Getting acquainted with the laboratory. General information, schedules. Personal- and equipment safety rules. Animal care regulations.
3. Blood I.
4. Blood I.
5. Blood II.
6. Blood II.
7. Blood II.

8. Blood II.
9. Blood III.
10. Blood III.
11. Blood III.
12. Blood III.
13. Blood IV.
14. Blood IV.
15. Blood IV.
16. Blood IV.
17. Seminar: Blood (Discussion of the topics covered by the lectures and student labs)
18. Seminar: Blood (Discussion of the topics covered by the lectures and student labs)
19. Test on the chapter
20. Test on the chapter
21. The heart and circulation I.
22. The heart and circulation I.
23. The heart and circulation I.
24. The heart and circulation I.
25. The heart and circulation II.
26. The heart and circulation II.
27. The heart and circulation II.
28. The heart and circulation II.
29. The heart and circulation III.
30. The heart and circulation III.
31. The heart and circulation III.
32. The heart and circulation III.
33. The heart and circulation IV.
34. The heart and circulation IV.
35. The heart and circulation IV.
36. The heart and circulation IV.
37. Seminar: The heart and circulation
38. Seminar: The heart and circulation
39. Test on the chapter
40. Test on the chapter
41. Respiration
42. Respiration
43. Respiration
44. Respiration
45. Gastrointestinal tract
46. Gastrointestinal tract
47. Gastrointestinal tract
48. Gastrointestinal tract
49. Examination of the urine
50. Examination of the urine
51. Examination of the urine
52. Examination of the urine
53. Measurement of the actual metabolic rate in human
54. Measurement of the actual metabolic rate in human
55. Measurement of the oxigen consumption in the rat.
56. Measurement of the oxigen consumption in the rat.

Seminars

Exam topics/questions

Topics of questions for the theoretical examination

1. Describe the body fluid compartments and explain the methods used for measurement of body fluid volumes
2. Describe the major plasma proteins and the other non-electrolytic constituents of blood and explain their function in the body
3. Describe the intra- and extracellular ionic components and explain their physiological functions
4. The structure, function and origin of erythrocytes
5. Characterize the various leukocytes indicating their origins and functions

6. Origin and function of blood platelets
7. The basic structure and metabolism of haemoglobin and the metabolism of iron
8. Describe the two pathways involved in the initiation of blood coagulation
9. Specific mechanism of clot formation
10. Describe the mechanism of fibrinolysis. Explain the significance of anticlotting mechanism
11. Regulation of H+ ion concentration in the blood
12. A-B-0 blood groups. The Rh blood types
13. The role of leukocytes in the defence mechanism
14. Mechanical activity of the heart and the three-component model of heart muscle. Calcium ion movements within the cardiac muscle cell
15. Generators and conductors of impulses in the heart. Refractory periods
16. The sequence of events in the cardiac cycle
17. The human electrocardiogram (ECG). Electrocardiography: bipolar and unipolar leads
18. The heart sounds. Phonocardiography (PCG)
19. Cardiac output: measurement, normal standards and physiological variations
20. Metabolism and energetics of cardiac muscle
21. Ventricular wall tension and the Laplace relationship
22. The heart-lung preparation (Starling's laws)
23. Arterial blood pressure: determinants of normal arterial blood pressure
24. The arterial and the venous pulse. Basic principles of hemodynamics.
25. Circulation through the capillaries
26. The properties, production and the movement of lymph
27. Circulation in the vein. Effect of gravity on circulation
28. The pulmonary circulation. Control of lung vessels
29. The coronary circulation
30. Cerebral circulation. The concept of 'blood-brain barrier'
31. Splanchnic circulation
32. Skeletal muscle circulation. Cutaneous circulation
33. Nervous control of the heart
34. Control mechanisms of the circulatory system: general considerations
35. Local control of the vascular smooth muscle
36. Autoregulation of blood flow in tissues and organs
37. The function and importance of baroreceptors in the regulation of circulation
38. Reflex control mechanisms of circulation
39. Mechanisms of vasoconstriction and vasodilatation
40. Mechanics of respiration (functions of respiratory muscles, compliance, intrathoracic pressures, respiratory volumes)
41. Alveolar air, alveolar ventilation, dead spaces. Function of the respiratory passageways
42. Gaseous exchange in the lungs and tissues
43. O2 and CO2 transport in the body
44. Peripheral and central regulatory mechanisms of respiration. Respiratory reflexes
45. Chemical control of respiration. Acidosis, alkalosis
46. Different types of hypoxia. Oxygen treatment. Mechanisms of acclimatisation. Nitrogen narcosis. Decompression sickness
47. Describe the origin, composition, function and control of salivary secretion
48. Describe the origin, nature and function of gastric secretion indicating the mechanisms of regulation
49. Mechanism and regulation of gastrointestinal movements
50. Identify the pancreatic secretions, their components, their action and the substrates on which they act. Control mechanism of pancreatic secretion
51. Describe the basic ingredients and functions of the bile indicating the origin and fate of the components and the factors controlling bile secretions and gall bladder functions
52. Identify the components and functions of the intestinal system
53. Describe how carbohydrate is digested and absorbed indicating the enzymes involved
54. Describe how fat is digested and absorbed indicating the enzymes and secretions involved
55. Describe how protein is digested and absorbed indicating the enzymes and secretions involved
56. Dynamics of glomerular filtration. Glomerular filtration rate. Plasma clearance
57. Renal blood flow. Clearance of PAH. Extraction ratio. Filtration fraction
58. Regulation of renal blood flow and pressure. Renin-angiotensin system
59. Reabsorption and secretion of different substances in the renal tubule. Methods for their investigation
60. Concentrating and diluting mechanisms of the kidney
61. Fluid volume regulation of the body
62. Regulation of concentrations of ions in the extracellular fluid. Regulation of osmolality of body fluids

63. Basal metabolic rate. Describe factors influencing the basal metabolism
64. Define metabolic rate explaining those factors influencing the total expenditure of energy by the body
65. Describe the necessary elements of normal diet
66. The normal body temperature and its physiological variations. Hyperthermia, fever, hypothermia
67. Chemical regulation of body temperature, changes of regulation at low and high environmental temperature
68. Physical regulation of body temperature, changes of regulation at low and high environmental temperature
69. Central regulatory mechanisms of heat production and heat loss
70. Mechanisms of hormone action (receptors, intracellular mediators, cAMP, Ca2+ and diacylglycerol, protein kinases)
71. Mechanism of hormonal regulation. Negative and positive feedback controls in the endocrine system
72. The anterior pituitary hormones. Regulation of pituitary hormone secretions. Pituitary dysfunction
73. Function of growth hormone during development and after adolescence
74. Abnormalities of thyroid secretion. Goitrogens
75. Function of the thyroid gland. Iodine metabolism in the body
76. Hormonal changes during menstrual cycle
77. Hormonal changes during pregnancy. Role of placenta in pregnancy. Foeto-placental unit
78. Hormones of lactation
79. Mechanism of erection and ejaculation. The sexual act (coitus)
80. The function of testis, epididymis, seminal vesicle and prostate
81. Regulation of the sexual behaviour. Maternal behaviour
82. Physiological changes at puberty and climacteric
83. Vasopressin and oxytocin. Function of ANH (atrionatriuretic hormone)
84. The effects of prostaglandins

Topics of questions for the student lab examination

1. Determine the bleeding time, clotting time and the prothrombin time (prothrombin-index)
2. Determination of protein content of serum
3. Describe the principle and the technique of the packed cell volume (haematocrit) determination
4. Determine the specific gravity of the blood (according to Hammerschlag). Determine the specific gravity of the blood and the blood plasma (according to Phillips -- Van Slyke)
5. Determination of osmotic resistance of red blood cells
6. How do you determine the erythrocyte sedimentation rate of a blood sample?
7. How do you determine the haemoglobin content of the blood? Spectroscopic examination of gas-compounds of haemoglobin
8. How do you determine the red blood cell count?
9. How do you determine the white blood cell count?
10. Determine the diameter and volume of red blood cells. Mean haemoglobin content (MCH) and haemoglobin concentration (MCHC) of erythrocytes
11. How do you make a blood film? Describe the morphological and staining characteristics of the different white blood cell types. Give the differential leukocyte count
12. How do you determine the reticulocyte count? How do you determine the platelet count?
13. How do you perform A, B, 0 and AB blood grouping?
14. How do you perform Rh blood grouping?
15. Electric and thermal stimulation of the heart. Demonstration of extrasystole
16. Experiments on the excitatory and conductive system of the heart (ligatures of Stannius). Demonstration of the 'all or nothing' law. Summation
17. Electrocardiogram. Recording of ECG
18. Heart sounds (phonocardiogram)
19. Effects of vagal and sympathetic stimulation on the heart. Goltz reflex
20. Experiments on isolated frog's heart by means of Straub cannula. Effects of different ions on isolated heart. Examination of effects of acetylcholine and adrenaline
21. Demonstration of neurotransmission on frog's heart after Loewi
22. Study of peripheral circulation in frog's blood vessels (examination of frog's tongue; experiment of Laewen and Trendelenburg)
23. Examination of the arterial pulse. Index of physical condition
24. Methods for measuring blood pressure in humans
25. Direct measurement of blood pressure in animal experiment
26. Thoracic percussion and auscultation
27. Spirometry. Volumes and capacities of the lungs. Vital capacity
28. Determination of respiration pressure. Donders model

29. Effects of respiration on the filling of the heart (experiments of Müller and Valsalva)
30. Examination of saliva
31. Determination of gastric acid secretion (BAO, MAO, PAO)
32. Determination of lactic acid and pepsin
33. Examination of the exocrine pancreas. Amylase determination in the serum and urine
34. Examination of bile. Determination of bile pigments
35. Examination of faeces
36. How do you perform a routine urinary screening?
37. How do you determine the specific gravity of urine?
38. Examination of protein, glucose and ketone bodies in the urine
39. Determination of haemoglobin, bilirubin and urobilinogen in the urine
40. How do you examine urine sediment?
41. Determination of basal metabolic rate. Measurement of oxygen consumption in rat

OAAKET PUBLIC HEALTH 3 (ENVIRONMENTAL HEALTH)

Course director: **DR. CSABA VARGA**, associate professor
Department of Public Health Medicine

1 credit ▪ semester exam ▪ Basic module ▪ autumn semester ▪ recommended semester: 3

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

Headcount limitations (min-max.): **5 – 0**

Prerequisites: **see in the recommended curricula!**

Topic

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

Conditions for acceptance of the semester

In the 8. semester students have to do a final exam of Public Health, for it they need completed courses, which are the followings: The basics of disease prevention (OAABMA), General epidemiology and demography (OAAAED), Environmental Health (OAAKET), Preventive medicine (OAPNEO), Detailed epidemiology (OAKREP), Occupational hygiene and Occupational medicine (OAKMFO).

Making up for missed classes

Maximum absence: 1 practice.

Reading material

Tompa (editor): Basic Principles of Public health (ISBN: 978 963 9879 13 3)

Lectures

1. Introduction to Environmetal Health. Basic principles. Methods: experimental toxicology and environmental epidemiology. Ecology, human ecology.
2. Natural and arteficial environment. Health effects of the indoor environment. Environmental monitoring, environmental protection.
3. Global environmental issues. Global warming. Atmospheric pollution. Emission, immission.
4. Health impacts of contaminants in water.
5. Health impacts of soil contaminants and wastes.
6. Chemical safety
7. Health effects of physical exposures I. Noise and vibration.

Practices

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

Seminars

Exam topics/questions

OAASF2 HISTOLOGY AND EMBRYOLOGY 2

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

4 credit ▪ semester exam ▪ Basic module ▪ autumn semester ▪ recommended semester: 3

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

Headcount limitations (min-max.): **5 – 260**

Prerequisites: **see in the recommended curricula!**

Topic

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

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

Conditions for acceptance of the semester

Students must make proper records with drawings in the classes. Acceptance of the records by the instructor of the group is a prerequisite for getting the signature at the end of the semester.

Absences (with any reason) from no more than 15 % of the lectures and classes (max. 8x45 min = e. g. 4 weekly practices, or 3 practices and 2 lectures, etc.).

Making up for missed classes

Exceptionally, students may attend the class of another group on the same week.

Reading material

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

Lectures

1. Lymphatic tissues and their functions.
2. Histology of the lymphatic organs.
3. Histology and development of the teeth.
4. Histology of the oral cavity, tongue and salivary glands.
5. Histology of the respiratory system
6. Development of the respiratory system.
7. Development of the face and the oral and nasal cavity. Malformations.
8. Development and derivatives of the pharyngeal gut.
9. Histology of the esophagus and the stomach
10. Histology of the intestines.
11. Early development of the heart; Development of sinus venosus and the atrial septum.
12. Development of the ventricles.
13. Branchial arteries and their derivatives. Formation of the venous system.
14. Fetal circulation.
15. Histology of the liver and the pancreas.
16. Development of the intestinal system, liver and pancreas.
17. Histology of the kidney.
18. Histology of ureter and urinary bladder. Development of the kidney.
19. Histology of ovarium. Follicular development.
20. The tuba uterina, uterus, and the vagina. Cyclic changes of the endometrium.
21. The pregnant uterus, the placenta and the breast.
22. Histology of male reproductive system I.
23. Histology of male reproductive system II.
24. Development of reproductive organs I.
25. Development of reproductive organs II.
26. Development of the peritoneum. Separation of the body cavities.
27. Clinical importance of the histology of the kidney (based on the lecture of Peter Degrell).
28. Parallelly developing organ systems. (Recapitulation of embryology)

Practices

1. Recapitulation of basic histology
2. --
3. Histology of the lymphatic organs
4. --
5. Histology of lip and teeth. Development of the teeth.
6. Histology of the salivary gland and the tongue

7. --
8. Histology of the respiratory system
9. --
10. The esophagus and the stomach
11. --
12. Small and large intestine
13. --
14. Development of the heart. (Embryology seminar)
15. --
16. Histology of liver, gall bladder and the pancreas
17. --
18. Histology of the kidney, the ureter and the urinary bladder
19. --
20. Histology of the female reproductive organs
21. --
22. Histology of the pregnant uterus, the placenta, the umbilical cord and the breast
23. --
24. Histology of the male reproductive organs I.
25. --
26. Histology of the male reproductive organs II.
27. --

Seminars

Exam topics/questions

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

OAABK2 BIOCHEMISTRY 2

Course director: **GALLYAS FERENC DR. JR.**, professor
Department of Biochemistry and Medical Chemistry

5 credit ▪ final exam ▪ Basic module ▪ spring semester ▪ recommended semester: 4

Number of hours/semester: **42 lectures + 28 practices + 0 seminars = total of 70 hours**

Headcount limitations (min-max.): **5 – 0**

Prerequisites: **see in the recommended curricula!**

Topic

The subject serves as a foundation for the preclinical subjects Pathobiochemistry, Pharmacology, Pathophysiology, and the clinical subjects Internal Medicine, Clinical Chemistry and Neurology.

The 2nd semester of the 2-semester Biochemistry course - based on the material covered by the 1st semester - gives a deeper view into the fundamentals of structure-function relationships of small- and macromolecules, especially focusing on the structure, function and regulation of the molecules that are involved in the storage and transmission of genetic information, and dealing with basic molecular biology techniques. Furthermore, the regulation mechanisms of metabolic, hormonal and signal transduction pathways on the levels of the cell as well as of the organism are covered. The special biochemical characteristics of the different organs are also discussed.

Conditions for acceptance of the semester

It is mandatory to attend the lectures and laboratory practices.

Requirements of the acceptance of Biochemistry 2 course are the following:

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

Making up for missed classes

Permission should be asked from the course director to do the practice with an other group. Permission will be given maximum 2 times.

Reading material

Nelson - Cox: Lehninger Principles of Biochemistry, 5th Ed, W.H. Freeman, 2008.

Berg - Tymoczko - Stryer: Biochemistry, 6th Ed, W.H. Freeman, 2007.

Devlin: Textbook of Biochemistry with Clinical Correlations, 6th Ed, Wiley-Liss, 2006

Experimental Biochemistry
Edited by Dénes Szabó, 1990

Lectures

1. Genes and chromosomes
2. DNA replication
3. DNA repair
4. RNA metabolism I (Veres Balázs)
5. RNA metabolism II (Veres Balázs)
6. Retroviruses
7. Protein synthesis I
8. Protein synthesis II
9. Posttranslational modifications of proteins
10. Protein targeting and transport
11. Regulation of gene expression I
12. Regulation of gene expression II
13. The mitochondrial protein synthesis and the disorders of the mitochondrial genome (Veres Balázs)
14. Recombinant DNA technologies (Debreceni Balázs)
15. The cell cycle and its regulation (Farkas Viktória)
16. Hormones I.
17. Hormones II. (Debreceni Balázs)
18. Hormones III, PPARs
19. Cell signalling, the CO and NO as signals, transcription factors (Veres Balázs)
20. Cell signalling induced by oxidative stress
21. Biochemistry of septic shock (Veres Balázs)

22. Oncogenes and oncogenesis (Debreceni Balázs)
23. Tumor supressors and cancer (Debreceni Balázs)
24. Structure of the extracellular matrix (Farkas Viktória)
25. Cell signalling, kinases
26. Genetic disorders of hemoglobin
27. Regulation of Fe metabolism, related diseases
28. Biochemistry of digestion: macronutrrients (Farkas Viktória)
29. Biochemistry of digestion: micronutrrients
30. Special functions of liver
31. Serum lipoproteins (Debreceni Balázs)
32. Changes accompanying the switch from fed to fasting state
33. Biochemistry of the immune system
34. Water soluble vitamins (Farkas Viktória)
35. Lipid soluble vitamins (Farkas Viktória)
36. Biochemistry of the senses
37. Nervous system I.
38. Nervous system II.
39. Molecular targets of drug-development
40. Genomics, proteomics, metabolomics
41. Current chances for gene therapy and for tumor therapy
42. Current theories about the origin of life and evolution

Practices

1. The inorganic phosphate requirement of the glycolysis
2. The inorganic phosphate requirement of the glycolysis
3. MPT in apoptosis and necrosis
4. MPT in apoptosis and necrosis
5. Study of body fluids
6. Study of body fluids
7. Molecular biology methods
8. Molecular biology methods
9. Determination of blood glucose
10. Determination of blood glucose
11. Advanced biotechnology
12. Advanced biotechnology
13. Determination of blood cholesterol
14. Determination of blood cholesterol
15. Genomics, proteomics, bioinformatics
16. Genomics, proteomics, bioinformatics
17. Determination of uric acid in blood
18. Determination of uric acid in blood
19. Hereditary metabolic diseases
20. Hereditary metabolic diseases
21. Determination of bilirubin in blood
22. Determination of bilirubin in blood
23. Acquired metabolic diseases
24. Acquired metabolic diseases
25. Study of cholinesterase
26. Study of cholinesterase
27. Consultation
28. Consultation

Seminars

Exam topics/questions

The list of exam topics is identical to the list of the titles of lectures of both semesters.

The exams, including the retaken exams are written exams of 40 open questions. Failure to answer more than three of the first 10 questions will automatically result in ‘failed’ grade.

OAAEL2 PHYSIOLOGY 2

Course director: **DR. ZOLTÁN KARÁDI**, professor
Department of Physiology

9 credit ▪ final exam ▪ Basic module ▪ spring semester ▪ recommended semester: 4

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

Headcount limitations (min-max.): **5 – 0**

Prerequisites: **see in the recommended curricula!**

Topic

The student has to know the functions and functional mechanisms of the organs, organ systems and the human body as a whole.

The student is required to understand and present

- the regulatory mechanisms of different physiological functions of the human body,
- the regulation of the integrated functions of the individual organs and organ systems,
- and the interrelationships among different control mechanisms in the human body including all the relevant chemical, biochemical, biological and anatomical data.

Conditions for acceptance of the semester

According to the Bylaws of the University of Pécs, Medical School (Code of Studies and Examinations), students are required to attend the lectures and practical classes. Students are required to perform the prescribed practical excercises and to keep a record of them. Missed classes must be made up.

Students are required to give account of their theoretical and practical knowledge during the semester. Exams can be taken only after fulfilling the above prerequisits.

The result of the exam will be based on the combined results of the mid-term tests and the exam performance.

Making up for missed classes

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

Reading material

W.F. Ganong: Review of Medical Physiology

Appleton and Lange, Lange Medical Publications, 1990-2006

A.C. Guyton: Textbook of Medical Physiology

W.B. Saunders Company, 1996-2006

J.B. West (ed.): Best and Taylor's Physiological Basis of Medical Practice

Williams and Wilkins, 1990-1998

Fonyó: Principles of Medical Physiology, Medicina Kiadó 2002

Laboratory exercises in physiology 2nd Semester (Endocrinology)

Lectures

1. Endocrinology of the adrenal cortex I
2. Endocrinology of the adrenal cortex II
3. Endocrinology of the adrenal cortex III
4. The adrenal medulla. Endocrinology of stress
5. Hormonal control of calcium homeostasis
6. The endocrine pancreas
7. Hormonal control of intermediary metabolism I.
8. Hormonal control of intermediary metabolism II.
9. Special problems of neonatal physiology
10. Physiology of ageing
11. Ionic mechanism of membrane potential
12. Action potential and its propagation
13. Function of neuromuscular junction
14. Electrophysiology of interneuronal synapses
15. Neurochemical basis of neurotransmission
16. General properties of spinal cord reflexes
17. Integrative functions of the spinal cord
18. The motor unit. Peripheral neural mechanism of muscle control
19. Functional importance of mechanoreceptors
20. Somaesthetic mechanism
21. Somatotopic representations in the sensory systems

22. Thalamocortical somatosensory functions. The sensory cortex
23. Pain mechanism
24. Molecular mechanism of muscle contraction
25. Mechanical characteristics of muscle
26. The source of energy for muscle contraction. Heat production
27. Electromyography. Control of muscle contraction; muscle tone, fatigue
28. Contraction of smooth muscle
29. The spinal shock
30. Decerebrate rigidity
31. Postural co-ordination, locomotion
32. Extrapyramidal system I
33. Extrapyramidal system II
34. Physiology of the vestibular system
35. Cerebellar control of motor functions I
36. Cerebellar control of motor functions II
37. Cortical control of motor functions. The pyramidal system
38. Optics of vision
39. Retinal mechanism
40. Visual pathways, midbrain mechanism of vision
41. Central mechanism of vision
42. Eye movements and their control
43. Physiology of hearing I
44. Physiology of hearing II
45. Central auditory mechanisms
46. The chemical senses I. Olfaction
47. The chemical senses II. Taste
48. The autonomic nervous system I
49. The autonomic nervous system II
50. Electroencephalography I
51. Electroencephalography II
52. Neural control mechanism of sleep
53. Clinical importance of the evoked potential technique
54. The diencephalon (hypothalamus). Its motor, autonomic and hormonal regulatory functions
55. The concept of drive and motivation
56. Homeostatic drives. Central neural regulation of hunger and thirst
57. Control of biological rhythms
58. The limbic system I
59. The limbic system II
60. Monoaminergic systems and their functions
61. Emotions and their central nervous mechanism
62. Mechanism of learning I
63. Mechanism of learning II
64. Types and disorders of memory functions I
65. Types and disorders of memory functions II
66. Plasticity of the peripheral and central nervous system
67. Intrinsic cortical mechanism. Functions of the frontal lobe
68. The parieto-temporal lobe
69. Cerebral dominance
70. Neurophysiological mechanisms of speech. Speech disorders

Practices

1. The endocrine pancreas
2. The endocrine pancreas
3. The endocrine pancreas
4. The endocrine pancreas
5. Reproduction
6. Reproduction
7. Reproduction
8. Reproduction
9. Peripheral nervous system I.

10. Peripheral nervous system I.
11. Peripheral nervous system I.
12. Peripheral nervous system I.
13. Peripheral nervous system II.
14. Peripheral nervous system II.
15. Peripheral nervous system II.
16. Peripheral nervous system II.
17. Seminar: Endocrinology, Peripheral nerve, Membrane potential, Action potential, Synaptic transmission
18. Seminar: Endocrinology, Peripheral nerve, Membrane potential, Action potential, Synaptic transmission
19. Student report (test)
20. Student report (test)
21. Experiments on muscles
22. Experiments on muscles
23. Experiments on muscles
24. Experiments on muscles
25. Electromyography, Examination of fatigue
26. Electromyography, Examination of fatigue
27. Electromyography, Examination of fatigue
28. Electromyography, Examination of fatigue
29. Examination of reflexes
30. Examination of reflexes
31. Examination of reflexes
32. Examination of reflexes
33. Central nervous system
34. Central nervous system
35. Central nervous system
36. Central nervous system
37. Seminar: Muscle and reflexes
38. Seminar: Muscle and reflexes
39. Student report (test)
40. Student report (test)
41. Sensory organs I.
42. Sensory organs I.
43. Sensory organs I.
44. Sensory organs I.
45. Sensory organs II.
46. Sensory organs II.
47. Sensory organs II.
48. Sensory organs II.
49. Electroencephalography in humans
50. Electroencephalography in humans
51. Electroencephalography in humans
52. Electroencephalography in humans
53. Student lab
54. Student lab
55. Student lab
56. Student lab

Seminars

Exam topics/questions

Topics of questions for the theoretical examination

1. Describe the body fluid compartments and explain the methods used for measurement of body fluid volumes
2. Describe the major plasma proteins and the other non-electrolytic constituents of blood and explain their function in the body
3. Describe the intra- and extracellular ionic components and explain their physiological functions
4. The structure, function and origin of erythrocytes
5. Characterize the various leukocytes indicating their origins and functions
6. Origin and function of blood platelets
7. The basic structure and metabolism of haemoglobin and the metabolism of iron

8. Describe the two pathways involved in the initiation of blood coagulation
9. Specific mechanism of clot formation
10. Describe the mechanism of fibrinolysis. Explain the significance of anticlotting mechanism
11. Regulation of H+ ion concentration in the blood
12. A-B-0 blood groups. The Rh blood types
13. The role of leukocytes in the defence mechanism
14. Mechanical activity of the heart and the three-component model of heart muscle. Calcium ion movements within the cardiac muscle cell
15. Generators and conductors of impulses in the heart. Refractory periods
16. The sequence of events in the cardiac cycle
17. The human electrocardiogram (ECG). Electrocardiography: bipolar and unipolar leads
18. The heart sounds. Phonocardiography (PCG)
19. Cardiac output: measurement, normal standards and physiological variations
20. Metabolism and energetics of cardiac muscle
21. Ventricular wall tension and the Laplace relationship
22. The heart-lung preparation (Starling's laws)
23. Arterial blood pressure: determinants of normal arterial blood pressure
24. The arterial and the venous pulse. Basic principles of hemodynamics.
25. Circulation through the capillaries
26. The properties, production and the movement of lymph
27. Circulation in the vein. Effect of gravity on circulation
28. The pulmonary circulation. Control of lung vessels
29. The coronary circulation
30. Cerebral circulation. The concept of 'blood-brain barrier'
31. Splanchnic circulation
32. Skeletal muscle circulation. Cutaneous circulation
33. Nervous control of the heart
34. Control mechanisms of the circulatory system: general considerations
35. Local control of the vascular smooth muscle
36. Autoregulation of blood flow in tissues and organs
37. The function and importance of baroreceptors in the regulation of circulation
38. Reflex control mechanisms of circulation
39. Mechanisms of vasoconstriction and vasodilatation
40. Mechanics of respiration (functions of respiratory muscles, compliance, intrathoracic pressures, respiratory volumes)
41. Alveolar air, alveolar ventilation, dead spaces. Function of the respiratory passageways
42. Gaseous exchange in the lungs and tissues
43. O2 and CO2 transport in the body
44. Peripheral and central regulatory mechanisms of respiration. Respiratory reflexes
45. Chemical control of respiration. Acidosis, alkalosis
46. Different types of hypoxia. Oxygen treatment. Mechanisms of acclimatisation. Nitrogen narcosis. Decompression sickness
47. Describe the origin, composition, function and control of salivary secretion
48. Describe the origin, nature and function of gastric secretion indicating the mechanisms of regulation
49. Mechanism and regulation of gastrointestinal movements
50. Identify the pancreatic secretions, their components, their action and the substrates on which they act. Control mechanism of pancreatic secretion
51. Describe the basic ingredients and functions of the bile indicating the origin and fate of the components and the factors controlling bile secretions and gall bladder functions
52. Identify the components and functions of the intestinal system
53. Describe how carbohydrate is digested and absorbed indicating the enzymes involved
54. Describe how fat is digested and absorbed indicating the enzymes and secretions involved
55. Describe how protein is digested and absorbed indicating the enzymes and secretions involved
56. Dynamics of glomerular filtration. Glomerular filtration rate. Plasma clearance
57. Renal blood flow. Clearance of PAH. Extraction ratio. Filtration fraction
58. Regulation of renal blood flow and pressure. Renin-angiotensin system
59. Reabsorption and secretion of different substances in the renal tubule. Methods for their investigation
60. Concentrating and diluting mechanisms of the kidney
61. Fluid volume regulation of the body
62. Regulation of concentrations of ions in the extracellular fluid. Regulation of osmolality of body fluids
63. Basal metabolic rate. Describe factors influencing the basal metabolism
64. Define metabolic rate explaining those factors influencing the total expenditure of energy by the body

65. Describe the necessary elements of normal diet
66. The normal body temperature and its physiological variations. Hyperthermia, fever, hypothermia
67. Chemical regulation of body temperature, changes of regulation at low and high environmental temperature
68. Physical regulation of body temperature, changes of regulation at low and high environmental temperature
69. Central regulatory mechanisms of heat production and heat loss
70. Mechanisms of hormone action (receptors, intracellular mediators, cAMP, Ca2+ and diacylglycerol, protein kinases)
71. Mechanism of hormonal regulation. Negative and positive feedback controls in the endocrine system
72. The anterior pituitary hormones. Regulation of pituitary hormone secretions. Pituitary dysfunction
73. Function of growth hormone during development and after adolescence
74. Abnormalities of thyroid secretion. Goitrogens
75. Function of the thyroid gland. Iodine metabolism in the body
76. Hormonal changes during menstrual cycle
77. Hormonal changes during pregnancy. Role of placenta in pregnancy. Foeto-placental unit
78. Hormones of lactation
79. Mechanism of erection and ejaculation. The sexual act (coitus)
80. The function of testis, epididymis, seminal vesicle and prostate
81. Regulation of the sexual behaviour. Maternal behaviour
82. Physiological changes at puberty and climacteric
83. Vasopressin and oxytocin. Function of ANH (atrionatriuretic hormone)
84. The effects of prostaglandins
85. The endocrine pancreas
86. Function of insulin in the body. Diabetes mellitus
87. Hormonal control of carbohydrate metabolism
88. Hormonal control of calcium and phosphor homeostasis
89. Hormonal function of the adrenocortical system. Hypophyseal regulation of the adrenocortical system. Stress and the adaptation syndrome
90. Function and regulation of mineralocorticoids
91. Function and regulation of glucocorticoids
92. Consequences of hypo- and hyperfunction of the adrenal cortex. Androgens and oestrogens of the adrenal cortex.
93. Hormones of the adrenal medulla. Importance of the sympathoadrenal system
94. Physiology of ontogenesis and ageing.
95. Molecular mechanism of muscle contraction. The regulatory role of calcium ion
96. Mechanical characteristics of muscle. Differentiation of fast and slow twitch muscle fibres. Role of the connective tissue in the function of muscles
97. Mechanism of fatigue
98. Electromyography (EMG)
99. The source of energy for muscle contraction (aerobe and anaerobe processes). Heat production during contraction-relaxation cycle
100. The neuromuscular junction
101. Structural and functional differences between skeletal and smooth muscles. Mechanism of smooth muscle contraction
102. Membrane potential and action potential: explain their ionic mechanisms. Membrane properties of CNS neurons
103. The compound action potential. Conductive properties of various nerve fibres
104. Neurochemistry of synapses, neurotransmitters, postsynaptic receptors and neuromodulators. EPSP, IPSP
105. The myotatic (stretch) reflex. Gamma motoneurons
106. The motor units. Central control of muscle contractions
107. Types of mechanoreceptors and their role in motor control
108. How do cutaneous mechanoreceptors help to explore, learn and know our environment?
109. Somatosensory mechanisms of spinal cord and brain stem
110. Pain mechanisms, central and peripheral components
111. Descendent control (gating) of nociception and of pain reactions
112. Organisation of primary somatosensory cortex, thalamocortical projection and somatotopy
113. The human electroencephalogram (EEG). Evoked potential (EP) technique
114. Neural mechanisms of sleep and correlated somatic, autonomic and bioelectrical phenomena. The role of reticular formation in the sleep-wakefulness cycle
115. The diencephalon (hypothalamus), its motor, autonomic and hormonal regulatory function
116. Hunger and thirst. Central regulatory processes of food and water intake
117. Central mechanisms of locomotion
118. Decerebration rigidity and spinal shock (symptoms and mechanisms)
119. Postural and righting reflexes, their central mechanisms and localisation within the spinal cord, brain stem and neocortex

120. Structure and function of the extrapyramidal system
121. Symptoms after damages of different extrapyramidal structures. Role of neurotransmitters in the extrapyramidal functions
122. Importance of the cerebellum in co-ordination of movements
123. Cerebellar cortical mechanisms
124. Structure and function of the vestibular system
125. Functions of the autonomic nervous system. Autonomic reflexes
126. Humoral mediators in the autonomic nervous system. Adrenergic, cholinergic and opioid receptors
127. Structures, connections and functions of the limbic system
128. Functions of the motor cortex. Symptoms following its damage
129. Corticospinal (pyramidal) system. Consequences of lesions of the pyramidal pathways and the peripheral motoneuron
130. The concept of drive and motivation. Their integrated neural mechanisms. Reticular activating system
131. Emotions and their central nervous mechanisms
132. The phenomena of operant (instrumental) and classical (Pavlovian) conditioning. Mechanism of reinforcement
133. Electrical and chemical self-stimulation. Rewarding (positive) and punishing (negative) reinforcement. Simple learning processes. Exceptional forms of conditioning
134. Types and disorders of memory functions
135. Cerebral dominance. Lateralisation of functions in the hemispheres. Split-brain examinations
136. Functions of the parietal and temporal association (intrinsic) areas of the neocortex. Symptoms after damages (apraxia, agnosia)
137. Neurophysiological mechanisms of speech. Speech disorders
138. Functions of the frontal lobe (prefrontal intrinsic area)
139. Functions of the temporal lobe (Kluver-Bucy syndrome)
140. Central monoaminergic systems and their functional significance
141. Peripheral auditory mechanisms (conductive apparatus and cochlea)
142. Central auditory pathways, acoustic cortex and related mechanisms
143. Physiological optics
144. The retina. Photoreceptors and neuronal functions in the retina
145. Central visual pathways, the visual cortex and their functions
146. Colour vision. Stereoscopic vision
147. Peripheral and central mechanisms of olfaction
148. Peripheral and central mechanisms of sensation of taste
149. Plasticity in the nervous system. Consequences of sensory deprivation in the visual cortex. Ageing. Transplantation

Topics of questions for the student lab examination

1. Determine the bleeding time, clotting time and the prothrombin time (prothrombin-index)
2. Determination of protein content of serum
3. Describe the principle and the technique of the packed cell volume (haematocrit) determination
4. Determine the specific gravity of the blood (according to Hammerschlag). Determine the specific gravity of the blood and the blood plasma (according to Phillips – Van Slyke)
5. Determination of osmotic resistance of red blood cells
6. How do you determine the erythrocyte sedimentation rate of a blood sample?
7. How do you determine the haemoglobin content of the blood? Spectroscopic examination of gas-compounds of haemoglobin
8. How do you determine the red blood cell count?
9. How do you determine the white blood cell count?
10. Determine the diameter and volume of red blood cells. Mean haemoglobin content (MCH) and haemoglobin concentration (MCHC) of erythrocytes
11. How do you make a blood film? Describe the morphological and staining characteristics of the different white blood cell types. Give the differential leukocyte count
12. How do you determine the reticulocyte count? How do you determine the platelet count?
13. How do you perform A, B, 0 and AB blood grouping?
14. How do you perform Rh blood grouping?
15. Electric and thermal stimulation of the heart. Demonstration of extrasystole
16. Experiments on the excitatory and conductive system of the heart (ligatures of Stannius). Demonstration of the ‘all or nothing’ law. Summation
17. Electrocardiogram. Recording of ECG
18. Heart sounds (phonocardiogram)
19. Effects of vagal and sympathetic stimulation on the heart. Goltz reflex

20. Experiments on isolated frog's heart by means of Straub cannula. Effects of different ions on isolated heart. Examination of effects of acetylcholine and adrenaline
21. Demonstration of neurotransmission on frog's heart after Loewi
22. Study of peripheral circulation in frog's blood vessels (examination of frog's tongue; experiment of Laewen and Trendelenburg)
23. Examination of the arterial pulse. Index of physical condition
24. Methods for measuring blood pressure in humans
25. Direct measurement of blood pressure in animal experiment
26. Thoracic percussion and auscultation
27. Spirometry. Volumes and capacities of the lungs. Vital capacity
28. Determination of respiration pressure. Donders model
29. Effects of respiration on the filling of the heart (experiments of Müller and Valsalva)
30. Examination of saliva
31. Determination of gastric acid secretion (BAO, MAO, PAO)
32. Determination of lactic acid and pepsin
33. Examination of the exocrine pancreas. Amylase determination in the serum and urine
34. Examination of bile. Determination of bile pigments
35. Examination of faeces
36. How do you perform a routine urinary screening?
37. How do you determine the specific gravity of urine?
38. Examination of protein, glucose and ketone bodies in the urine
39. Determination of haemoglobin, bilirubin and urobilinogen in the urine
40. How do you examine urine sediment?
41. Determination of basal metabolic rate. Measurement of oxygen consumption in rat
42. Examination of oestrus cycle in rat
43. Different tests of pregnancy
44. Determination of human blood glucose level. Experimental manipulation of blood glucose level in the rabbit
45. Effects of chemical stimuli on striated muscle
46. Direct and indirect stimulation of nerve-muscle preparation. Effect of curare
47. Recording of a twitch contraction. Superposition. Effects of repetitive stimulation on muscles (complete and incomplete tetanus)
48. Effect of load on muscular contraction. Examination of fatigue in nerve-muscle preparation. Finger ergograph after Mosso
49. Electromyographic registration methods (surface and deep electrodes). Taking an EMG
50. Measurement of conduction velocity of peripheral nerve trunks. Recording of a compound action potential from a nerve
51. Demonstration of the Pflüger's law
52. Chronaxia and rheobase. Electrical stimulation of nerves and muscles in man
53. Examination of reflexes in frog. The law of Bell and Magendie
54. Examination of reflexes in the human
55. Stereotaxic technique
56. Reflex time, reaction time and action time
57. Electroencephalogram (EEG). Taking an EEG
58. Measurement of visual acuity. Refractive errors and their corrections
59. Examination of visual accommodation
60. Measurement of astigmia
61. Examination of pupillary reflex
62. Ophthalmoscopy
63. Perimetry
64. Examination of colour weakness and colour blindness
65. Examination of afterimages, colour-mixing and contrast effects
66. Laryngoscopy and otoscopy
67. Electronic audiometry
68. Tuning fork tests in human audiometry
69. Examination of the taste and olfactory senses

OAAIMM BASIC IMMUNOLOGY

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

4 credit ▪ semester exam ▪ Basic module ▪ spring semester ▪ recommended semester: 4

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

Headcount limitations (min-max.): **3 – 0**

Prerequisites: **see in the recommended curricula!**

Topic

Introduction to the current immunobiology. Construction of the human immune system: organs, tissues, cellular and molecular components. Organisation and regulation of immune functions: recognitin, differentiation, effector functions and memory formation. Main aspects of the physiological and pathological immune functions. Basic immunopathological aspects of immune related diseases including autoimmune diseases, organ transplantation, allergy, immunity against tumors.

Conditions for acceptance of the semester

Prepared attendance on lectures and practices. No more abscence than 3 practices.

Making up for missed classes

Practice perfromed with another group on the same week.

Reading material

Lectures

1. Introduction, historical overview, main aspects and perspectives in the theoretical and pactical immunology - immunobiology
2. Composition of the immune system: developmental properties of its organs, tissues and cells
3. Molecular components of the immunological recognition: Antibodies and B cell receptors
4. MHC and their classes, structure and functions
5. Recognition of antigen by T cells . Antigen presentation and MHC restriction
6. Role of co-receptors and adhesion molecules
7. Primary lymphocyte maturation. Expression of antigen receptor genes
8. Primary B cell development: maturation stages and environmental regulators
9. T-cell development in the thymus. Stages of maturation and the role of environmental factors
10. Innate immunity: inflammation, leukocyte migration
11. Complement system
12. Cytokines and their role in immune regulation
13. The central phase of the immune response: cellular interactions, T-B cell cooperation, antibody production. Signal transduction following Ag-recognition
14. The central phase of the immune response: cellular interactions, T-B cell cooperation, antibody production.
15. The role of adhesion molecules and cytokines in the Th1-Th2 differentiation and isotype expression.
16. Maintenance of the immunological memory and its role in immune response regulation. Comparison of the primary and secondary immune response.
17. Cell mediated immunity (CMI): Cytotoxicity (NK cells, cytotoxic T cells) TH cell mediated macrophage activation (delayed type hypersensitivity = DTH.)
18. Cell mediated immunity (CMI) II
19. Regulation of the effector functions: Immunoglobulin mediated immune reactions. Fc receptors.
20. Suppression of immune response. Role of the antigen, antigen presenting cells, T and B lymphocytes. Immunoglobulin-immunoglobulin interactions, idiotype network.
21. Systemic and local immunity: Mucosa and skin associated immune system
22. Immunological tolerance: Cellular and molecular mechanisms of the immunological tolerance
23. Miss-regulation of immune system: development of organ-specific and systemic autoimmune diseases
24. Hypersensitivity reactions
25. Cellular and molecular mechanism of allergies. T cell mediated macrophage activation, delayed type hypersensitivity (DTH)
26. Immunity against tumors
27. Immunological aspects of organ transplantation
28. Acquired and heredited immunodefficiencies

Practices

1. Main cellular and molecular components of the immune system (seminar)
2. Main cellular and molecular components of the immune system (seminar)
3. Development and composition of the lymphoid system. Microscopic structure of the lymphoid tissues.
4. Development and composition of the lymphoid system. Microscopic structure of the lymphoid tissues.

5. Immunisation techniques. Antibody (polyclonal and monoclonal) production, purification, labelling. Hybridoma technology, fermentation.
6. Immunisation techniques. Antibody (polyclonal and monoclonal) production, purification, labelling. Hybridoma technology, fermentation.
7. Main aspects of immunocytochemistry. Intracellular immunoglobulin detection by immunoperoxidase technique
8. Main aspects of immunocytochemistry. Intracellular immunoglobulin detection by immunoperoxidase technique
9. Preparation of white blood cells from the peripheral whole blood. 'Ficoll gradient' centrifugation.
10. Flow cytometry. Determination of different CD markers on human peripheral blood cells
11. Consultation
12. Consultation
13. Immunoserology I. ELISA, dot-blot, Western blot.
14. Immunoserology I. ELISA, dot-blot, Western blot.
15. Immunoserology II.Immunprecipitation, immunodiffusion techniques (Manchini, Ouchterlony),immunoelectrophoresis. Haemagglutination techniques, Coombs test.
16. Immunoserology II.Immunprecipitation, immunodiffusion techniques (Manchini, Ouchterlony),immunoelectrophoresis. Haemagglutination techniques, Coombs test.
17. Short-term and long-term cell cultures. In vitro functional tests of phagocytes, cytotoxic cells
18. Short-term and long-term cell cultures. In vitro functional tests of phagocytes, cytotoxic cells
19. Immune response against pathogens (seminar)
20. Immune response against pathogens (seminar)
21. Types of vaccines and modes of their action. (Slides)
22. Types of vaccines and modes of their action. (Slides)
23. Possible targets in immuntherapies. Monoclonal antibody therapy. (Slides)
24. Possible targets in immuntherapies. Monoclonal antibody therapy. (Slides)
25. Autoantibody detection, tissue typing, determination of the HLA.
26. Autoantibody detection, tissue typing, determination of the HLA.
27. Consultation
28. Consultation

Seminars

Exam topics/questions

See on web site www.immbio.hu

OAANEA ANATOMY, HISTOLOGY, EMBRYOLOGY AND NEUROANATOMY

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

9 credit ▪ final exam ▪ Basic module ▪ spring semester ▪ recommended semester: 4

Number of hours/semester: **42 lectures + 84 practices + 0 seminars = total of 126 hours**

Headcount limitations (min-max.): **5 – 200**

Prerequisites: **see in the recommended curricula!**

Topic

Macroscopic and microscopic anatomy, and development of the central nervous system. Morphological basis of neuroendocrine integration. Regional anatomy of the head and the neck.

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

Conditions for acceptance of the semester

Absence (for any reason) from not more than 15% of teaching hours (= 19 hours)

Making up for missed classes

Individual study on the consecutive practices of the group.

Reading material

http://an-server.pote.hu

Lectures

1. Histology of the skin.
2. Development of the nervous system, molecular-genetical background.
3. Basic neurohistology. The neuron 1.
4. Basic neurohistology. The neuron 2.
5. Basic neurohistology. Axon terminals 1. Synapses.
6. Basic neurohistology. Axon terminals 2. Receptors.
7. Basic neurohistology. The glia.
8. Research methods in neurohistology.
9. Blood supply and meninges of the spinal cord, clinal aspects.
10. Microscopic organisation of the spinal cord.
11. Spinal reflexes.
12. Ascending pathways of the spinal cord.
13. Descending pathways of the spinal cord.
14. The overall structure of the rhombencephalon and the mesencephalon.
15. Nuclei of the cranial nerves.
16. The reticular formation.
17. Anatomical bases of brainstem reflexes.
18. The general structure of the cerebellar cortex.
19. Connections and functions of the cerebellum.
20. Clinical implications of the brainstem.
21. The diencephalon. The thalamus.
22. Basal ganglia.
23. Cerebral cortex.
24. Structure and connections of the hippocampus.
25. The hypothalamus and the hypothalamo-hypophyseal system.
26. Endocrine organs 1.
27. Endocrine organs 2.
28. The eye.
29. The eye and its development.
30. The external muscles of the eye, movements of the eye and their central mechanisms.
31. The retina.
32. Visual pathway.
33. The tympanic cavity, its contents and their development.
34. The bony and membranous labyrinth and their development.

35. The auditory pathways.
36. The vestibular system.
37. Neural basis for the movement-coordination.
38. The somato-sensory systems.
39. Autonomous nervous system 1.
40. Autonomous nervous system 2.
41. Circulation of the cerebrospinal fluid, blood supply of the brain, meninges: clinical implications.
42. Closing lecture.

Practices

1. Dissecting room: The skull.
2. Dissecting room: The skull.
3. Histology: The skull.
4. Dissecting room: Dissection of the brain.
5. Dissecting room: Dissection of the brain.
6. Histology: The integument.
7. Dissecting room: Dissection of the brain.
8. Dissecting room: Dissection of the brain.
9. Histology: Neurons, peripherial nerves.
10. Dissecting room: Sections of the brain.
11. Dissecting room: Sections of the brain.
12. Histology: Nerve terminals, glia.
13. Dissecting room: The spinal cord.
14. Dissecting room: The spinal cord.
15. Histology: Histology of the spinal cord.
16. Dissecting room: Regions of the head and neck.
17. Dissecting room: Regions of the head and neck.
18. Histology: The spinal cord and the brainstem (seminar).
19. Dissecting room: Regions of the head and neck.
20. Dissecting room: Regions of the head and neck.
21. Histology: The cortex of the cerebellum.
22. Dissecting room: Regions of the head and neck.
23. Dissecting room: Regions of the head and neck.
24. Histology: Cerebellum and diencephalon (seminar).
25. Dissecting room: Regions of the head and neck.
26. Dissecting room: Regions of the head and neck.
27. Histology: Cerebral cortex.
28. Dissecting room: Dissection of the brain in situ.
29. Dissecting room: Dissection of the brain in situ.
30. Histology: Endocrine organs 1.
31. Dissecting room: Dissection of the brain in situ.
32. Dissecting room: The orbita.
33. Histology: Endocrine organs 2.
34. Dissecting room: The orbita.
35. Dissecting room: The inner ear.
36. Histology: The eye.
37. Dissecting room: The inner ear.
38. Dissecting room: X-ray, MR/CT pictures of the brain and brain vessels.
39. Histology: The inner ear.
40. Dissecting room: Recapitulation, preparation for the exam.
41. Dissecting room: Recapitulation, preparation for the exam.
42. Histology: Recapitulation, preparation for the exam.

Seminars

Exam topics/questions

http://an-server.pote.hu

OAASZO BEHAVIORAL SCIENCE 3 (MEDICAL SOCIOLOGY)

Course director: **DR. ZSUZSANNA FÜZESI**, associate professor
Department of Behavioural Sciences

2 credit ▪ semester exam ▪ Basic module ▪ spring semester ▪ recommended semester: 4

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

Headcount limitations (min-max.): **1 – 150**

Prerequisites: **see in the recommended curricula!**

Topic

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

Conditions for acceptance of the semester

According to the Code of Studies and Examinations.

Making up for missed classes

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Reading material

D. Armstrong: An Outline of Sociology as Applied to Medicine, 4th edition. Wright, London, 1994

Lectures

1. Introduction. Sociological approaches to health and medicine
2. Introduction. Sociological approaches to health and medicine
3. Illness behaviour
4. Illness behaviour
5. Measuring health and illness
6. Measuring health and illness
7. Social causes of illness
8. Social causes of illness
9. Labelling behaviour
10. Labelling behaviour
11. Inequalities in health
12. Inequalities in health
13. Coping with illness
14. Coping with illness
15. Models of illness
16. Models of illness
17. Types of health care
18. Types of health care
19. Clinical autonomy
20. Clinical autonomy
21. Delivering health care
22. Delivering health care
23. Evaluating health care
24. Evaluating health care
25. Social basis of disease
26. Social basis of disease
27. Social role of medicine
28. Social role of medicine

Practices

Seminars

Exam topics/questions

Semester exam:

Written multiple choice test, about 50-60 questions. Improvement of exam mark: oral exam.

Knowledge basis of exam:

Reference book and handout of lectures (format: ppt, pdf).

Questions of oral exam: titles and subtitles of the lectures and the reference book.

Further details about the exam and an optional knowledge survey test can be read at the homepage of the Institute of Behavioural Sciences: www.aok.pte.hu/magtud