

REQUIREMENTS (Faculty of Dentistry)

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| Semmelweis University | |
| Faculty of Medicine | Department of Physiology |
| Name of subject: Medical and Dental Physiology | |
| Subject code: FOKOELT187_1A, FOKOELT187_2A | |
| Credit Points: 9 (I. semester) + 9 (II. semester) | |
| Head of the Department : Dr. László Hunyady, Full Professor | |
| Course Director: Dr. Péter Várnai, Full Professor | |
| Tutor: Dr. András Balla | |
| Year: 2017/2018 | |
| Aim of Medical and Dental Physiology course: The goal of Medical and Dental Physiology course is to give the students the understanding of the concepts and principles of medical and dental physiology. The lectures provide the information base while the seminars and practices provide the student with an opportunity to assimilate and integrate the material. Appropriate clinical perspectives are presented throughout the course. | |
| Schedule of the subject: First semester | |
| <ol style="list-style-type: none">1. Introduction, body fluids. Functions of cellular membranes, transport across membranes. Transepithelial transports.2. Signal transduction: receptors, G proteins, second messengers. Cellular calcium metabolism, receptors of growth factors and cytokines. Membrane trafficking and vesicular transport.3. Ion channels and resting membrane potential. Action potential. Physiology of nerve cells, synaptic transmission in the central nervous system.4. Autonomic neurotransmitters and physiology of smooth muscle. Neuromuscular junction and physiology of skeletal muscle. Physiology of the heart I.: origin and spread of cardiac excitation.5. Cardiac cycle. Regulation of cardiac output. Electrocardiography (ECG).6. Physiology of blood circulation: introduction. Hemodynamics, systemic circulation. Microcirculation.7. Venous circulation and lymph flow. Local control of circulation. Reflex control of circulation.8. Circulation of blood in the brain and coronary circulation. Splanchnic circulation, circulation of skin and skeletal muscle.9. Respiration: pulmonary ventilation. Gas exchange in the lungs. Pulmonary circulation, ventilation-perfusion relationship.10. Gas transport, hypoxias. Regulation of respiration. Adaptation of cardiovascular and respiratory system.11. Renal function: renal circulation, glomerular filtration. Tubular functions. Concentration, dilution.12. Regulation of body fluids and osmotic concentration. Introduction to acid-base balance. | |

Acid-base balance: role of lungs and kidneys.

13. General principles of regulation in the gastrointestinal tract. Motor functions of the gastrointestinal tract.
14. Secretory functions of the gastrointestinal tract. Digestion and absorption of food. Energy balance, quality and quantity requirement of food.

Second semester

1. Haematopoiesis. Haemostasis, overview of immune system. Principles of the innate immunity.
2. Humoral immunity. Cellular immunity. Regulation of immune response, blood groups
3. Endocrine regulations. The hypothalamo-adenohypophyseal system; growth hormone, somatomedins.
4. Function of the adrenal cortex. Function of the thyroid gland.
5. Hormonal regulation of intermediary metabolism.
6. Calcium metabolism, bone tissue, growth. Function of the reproductive system: endocrinology of the sexual differentiation and development.
7. Function of the reproductive system: male sexual function; female sexual function; endocrinology of pregnancy, parturition, and lactation.
8. Introduction to neurophysiology. Physiology of nerve & glia cells.
9. Sensory functions.
10. Physiology of hearing and equilibrium.
11. Physiology of vision.
12. Motor functions.
13. Integration of autonomic responses.
14. Electroencephalogram (EEG); sleep phenomena. Learning and memory. Regulation of behavioral mechanisms, motivation; emotion.

Practices, I. semester:

- Typing of Blood Groups, Blood Coagulation Test
- Blood cell counting, determination of hemoglobin concentration and hematocrit, measurement of erythrocyte sedimentation rate
- Leukocyte differential count on peripheral blood smear
- Recording and analyzing the human ECG
- Blood pressure measurement in humans
- Computer simulation: Skeletal and smooth muscle
- Evaluation of acid-base parameters with the Siggaard-Andersen nomogram

Practices, II. semester:

- Circulatory and respiratory reflexes in rabbit
- Human pulmonary function tests
- Smooth muscle of rabbit small intestine
- Oral glucose tolerance test (OGTT)
- Human acid-base examinations (Astrup)
- EEG-demonstration
- Electrooculography (EOG) and investigation of the vestibular system

- Electromyography (EMG), nerve conduction velocity
- Computer simulation: Studies on circulatory reactions of a virtual rat

Attendance at classes: The lecture hours per week are 6; the practice hours per week are 3.5. The attendance of a minimum of 75% of practices (including seminars) is necessary for the end-term signature.

Absences:

No more than three absences from practices are allowed for any reason; otherwise the semester will not be credited. Missed sessions must be reported to the teacher the week after. There are no extra practices. Absence from the exam must be certified at the Head of the Department or Course Director within 3 working days.

Grading Performance in Seminars and Practices:

The knowledge of the students is tested in a written form on a weekly base. The written short tests cover the material of lectures of the previous week. The following rules will be enforced during the short tests: electronic devices must be kept in the baggage; any form of communication is disallowed; students not complying with these rules will be disqualified immediately. Evaluating the work of the student is based on his/her classroom tests and performance practice in the regular period of the semester. Missed tests cannot be repeated. The evaluation of the weekly written test will be expressed as a percentage. The average of the best written tests (the tests in the semester minus the three worsts) and the practical grade (also is expressed as a percentage) result a five-point scale:

0-54 % = 1, 55-64 % = 2; 65-74 % = 3, 75-84 % = 4, 85-100 % = 5.

This grade is taken into account in the exams.

Obtaining signatures:

The attendance of a minimum of 75% of practices (including seminars) is necessary for the end-term signature. Students must write a lab report for each practice using the Practical Book. The Practical Book should be signed by the teacher not later than one week after the practice. Participation in the practices is compulsory. No more than three absences from practices (6 seminar hours and 4.5 practice hours) are allowed for any reason; otherwise the semester will not be credited.

Semi-final and final exams:

In the examination period the students have to give semi-final exam in the first semester and final exam in the second semester.

Type and grading of exams:

The semi-final exam is oral exam. The oral exam consists of two theoretical questions (I-II). The overall result of the oral exam is based on the two theoretical grades and the lab work grade but a failed (1) theoretical question results in an overall failed (1) final exam.

The final exam consists of written and oral part. The written and oral part of the final exam is held on the same day. The oral part consists of two theoretical questions (I-II). Failed (1) theoretical question results in an overall failed (1) final exam. The mathematical average of four grades (lab grade, written exam grade, and two oral exam grades) gives the grade of the final exam.

Lists of the theoretical questions are listed in the webpage in the Department of Physiology. The following rules will be enforced during the exams: electronic devices must be kept in the baggage; baggage and overcoats should be placed next to the wall of the lecture halls; any form of communication is disallowed; students not complying with these rules will be disqualified immediately.

Requirements of the exams:

Semi-final exam: material of the Medical and Dental Physiology I.

Final exam: material of the Medical and Dental Physiology I. and Medical and Dental

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| Physiology II. |
| Registration for the exam: Registration for the exam must be recorded through the NEPTUN system. |
| Modification of the registration for the exam: Modification in the registration must be recorded through the NEPTUN system not later than 48 hours before the start of the exam. |
| Absences from the exams: Absence from the exam must be certified at the Head of the Department or Course Director within 3 working days. Failing to certify absence or denying it cause registering “absence” = “nem jelent meg” in the lecture book and/or in the NEPTUN system. |
| List of textbooks: Textbook: Koeppen-Bruce M- Stanton- Bruce A: Berne & Levy Physiology (7th edition). Practice book: Practices in Medical Physiology (Edited by: Péter Enyedi and Levente Kiss, 2017) |