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### თბილისის ჰუმანიტარული სასწავლო უნივერსიტეტი

**TBILISI HUMANITARIAN TEACHING UNIVERSITY**

**Syllabus**

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| **Name of the course /module** | **Physiology 1** |
| **Code of the course** | **PhM0409DM** |
| **Status of the course****(elective/compulsory)** | **C**ompulsory coursefor the one-cycle higher educational Programme-Dentistry |
| **ECTS** | **4 credits.Total:100 hours**Contact Hours–49 hours (Class Meeting Time Period:15L/30Pr.) + 4 hours( Midterm:2h and Final Examination 2h):Individual Work-51 hours |
| **Authors (lecturer)** | Nino Ormotsadze - Ph.D. (Biology)THTU professor Tel 2533673, 595274835.e–mail - ninoori @ yahoo.comConsultation days: according to consultation schedule – Monday, Wednesday, 13.00-15.00 |
| **Aim of the course** | The aim of the course is to introduce students to the ongoing basic vital, life-giving processes in the organism, to introduce cellular functions (excitability, conductivity, contraction, transmission) and regulatory systems in healthy body, figure out biological reactions emerged in tissues at the cellular level and the specific functions, the mechanism of their formation, evaluate the functional disorder level of the organism on the basis of the understanding of normal physiology characteristics. |
| **Program prerequisits** | N/A |
| **Assessment system and criteria** | **Assessment system of the Tbilisi Humanitarian Teaching University's** is divided into the following components:The total marks of the mid term Out of the overall assessment (100 points ) is 60 points, which includes three kinds of grades:**Student’s activity during a semester;****One-midterm exam;****final exam**-**40 points.**Theminimum competence requirement for mid termevaluation components is at least 18 points in total.**The minimum competence requirement of the final evaluation is 50% of the total mark from final evaluation that means 20 points out of 40.**Evaluation System includes: I. Five Forms of Positive Assessment:  (A) Excellent – 91% and more from maximum evaluation  (B) Very good – 81-90% from maximum evaluation (C) Good – 71-80% from maximum evaluation (D) Satisfactory – 61-70% from maximum evaluation (E) Sufficient – 51-60% from maximum evaluation II. Two Forms of Negative Assessment: (A)(FX) Fail (Not passed ) - 41-50 from maximum evaluation score, which means that the student will need to work more and to retake the test after additional independent work;(B) (F) Fail – A student gets 40 points, or less from maximum evaluation, which means that the work done by him/her is not sufficient and s/he has to retake the course from the beginning. 1. One of the negative assessment: In case of not passing, the University fixes additional exam at least in 5 days, after the announcement of final examination results, which must be published in the examination table.2. The grades, which student gets after additional test is a student's final grades, in which is not considered the negative points of the major examination.If a student receives from 0 to 50 points after additional test, in the final exam sheet is formed (F) -0 for the student. |
| **Course description** | appendix 1 |
| **Assessment system/activities, methods****and criteria** | The sum of the course assessment (100 points) breaks down as follows:* **Activities - 30points**
* **Midterm exam - 30points**
* **Final Exam - 40 points**
1. **Activities** (Participation)- **30 points,** ongoing evaluation - is calculated in accordancewith the level of being active during each practices(once a week, total number 15) type of activities can be answering questions, participation in discussion,participation in everyday testes - is equal **2 points**.

2 points - s/she is active during classes, obtains perfect knowledge of the ongoing topic, answers all questions completely. 1,0 points - s/he is less active during classes, does not present perfect knowledge of the ongoing topic, answers questions partly. 0 -s/he is less active during classes/group works, does not present perfect knowledge of the ongoing topic, does not answer any questions.**Midterm exam - (30 points)** administered in writtenform (the computer test)**.****Final Exam -40 points**The examination is conducted by a combination of computer testand includes:The computer test -**20 points**Written task -**20 points** / 4 briefbrief topics, each is equal 5pointsCriteria of assessment of written topics are :**5 points –**The answer is complete; Terminology is configured; student obtains perfect knowledge of the topic, s/he coveres of the material fluently, summarises core and additional literature, reveales critical thinking and logical analysis.**4 points** -The answer is not absolutely complete; student obtains knowledge of the topic, without important mistakes, s/he coveres of the material fluently, summarises core literature, reveales critical thinking and logical analysis.**3 points -** The answer is not complete; student obtains satisfactory knowledge of the topic, s/he coveres of the material by mistakes, summarises core literature, reveales less of critical thinking and logical analysis.**2 points** - The answer is weak; student obtains satisfactory knowledge of the topic, makes mistakes, does not summarises core literature, cant make critical thinking and logical analysis.**1 points -** The answer is substantially incorrect. Set out in the relevant material of the individual fragments. The student is not able to analyze the material. |
| **Core literature:** | 1. Textbook of Medical Physiology, A. Guyton &J.Hall (Eds), 2010, 2012.
2. M.Persaud The Developing Human-Clinically Oriented Embryology-7 th Edition
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| **Additional literature** | 1. Review of Medical Physiology, W.Ganong (Ed), 2011,
2. Human Physiology, Pocock& Richards (Eds), 2013.
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| **Learning outcomes, competences****(general and field specific)** | **Knowledge**1. Student describes the principles of the basic vital, life-giving functions of the organism, the ongoing physiological processes
2. Student groups and divides the ongoing processes in the body by of view physiologic anatomy
3. Student identifies indicators of determine regulatory mechanisms of human physical and mental health and physical work ability and training.
4. Student describes the Function of the human nervous system and the mechanism of Central Nervous System Synapses.

**Skills**1. Student analyzes the problem of transmission of impulses from nerves to skeletal muscle fibers
2. Student draws argumentative conclusions about drugs that affects transmission at the neuromuscular junction.
3. Student makes appropriate recommendations based onneural and hormonal control of smooth contraction.

**Responsibilities**1. Student objectively and critically evaluates personal knowledge
2. Student identifies appropriate learning resources for future learning.
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| **Learning / Teaching methods** | * Lecture/ practical
* Individual/Group work
* Verbal teaching method
* Demonstration of study materials
* Presentation
* Explanationmethods
* Discussion/debate
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**Appendix1**

**Course description:**

**Topics of the lecture, practical classes/laboratory work/working group, literature**

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| **Week №** | **Type of****the class** | **Topics** | **Contact hours** | **literature** |
| **Iweek** | Lect. | Physiology as basement of clinical and experimental medicine. Physiological methods of investigation*.* | **1** | **1** |
| Pract. | Transport of substances through cell membrane. Transport molecules across the plasma membranes. Physiological processes and their regulation. | **2** | **1** |
| **IIweek**  | Lect. | The lipid barrier of the cell membrane, and cell membrane transport proteins. | **1** | **1** |
| Pract. | Diffusion. Facilitated diffusion. Osmosis. Active transport. Primary active transport. Sodium-potassium pump. Secondary active transport- co-transport and counter-transport. | **2** | **1** |
| **IIIweek** | Lect. | Membrane potentials caused by diffusion. Resting membrane potential of nerves. Nerve action potential.  | **1** | **1** |
| Pract. | Roles of other ions during the action potential. Propagation of the action potential. All or nothing principle.  | **2** | **1** |
| **IVweek** | Lect. | Plateau in some potentials. Excitation-the process of eliciting the action potential. | **1** | **1** |
| Pract. | Myelinated and unmyelinated nerve fibers. Refractory period after an action potential. | **2** | **1** |
| **V week** | Lect. | Contraction of skeletal muscles.Physiologic anatomy of skeletal muscle. Molecular mechanism of muscle contraction: | **1** | **1** |
| Pract. | molecular characteristics of the contractile filaments;  | **2** | **1** |
| **VIweek** | Lect. | interaction of myosin, actin filaments, and calcium ions to cause contraction; | **1** | **1** |
| Pract. | sources of energy for muscle contraction. | **2** | **1** |
| **VII week** | Lect. | The Nervous System: A. General Principles and Sensory Physiology. Organization of the Nervous System, Basic Functions of Synapses, and Neurotransmitters. Sensory Receptors, Neuronal Circuits for Processing Information. | **1** | **1** |
| Pract. | Central Nervous System Synapses. Some Special Characteristics of Synaptic Transmission. Types of Sensory Receptors and the Stimuli They Detect. Transduction of Sensory Stimuli into Nerve Impulses. Nerve Fibers That Transmit Different Types of Signals and Their Physiologic Classification. Excitation and contraction of smooth muscles | **2** | **1** |
| **VIII week** | **Midterm** | **2** |  |
| **IX week** | Lect. | Function of the human nervous system. Morphological units of the nervous system, neurons types, the general principles of the structure of the nervous system; Neuroglia. Synapses and their types. | **1** | **1** |
| Pract. | the general principles of the structure of the nervous system; Neuroglia. Synapses and their types. | **2** | **1** |
| **X week** | Lect. | Vegetative nervous system and its morphofunctional characterization. The sympathic and parasympathic systems in the internal organs. Excitation transfer vegetative system. Mediators. The sympathic and parasympathic system functions. | **1** | **1** |
| Pract. | The sympathic and parasympathic system functions. | **2** | **1** |
| **XI week** | Lect. | Transmission of impulses from nerves to skeletal muscle fibers. neuromuscular junction |  | **1** |
| Pract. | Secretion of acetylcholine by the nerve terminals,  |  | **1** |
| **XII week** | Lect. | Acetylcholine formation and release, Muscle action potential. | **1** | **1** |
| Pract. | Contraction of smooth muscle.  | **2** | **1** |
| **XIII week** | Lect. | Types of smooth muscles. | **1** | **1** |
| Pract. | Contractile process in smooth muscle. | **2** | **1** |
| **XIV week** | Lect. | The properties of blood. The principal roles of the blood and its constituents.  | **1** | **1** |
| Pract. | The physical and chemical characteristics of the red blood cells. Blood clotting. Vascular-platelet and coagulative hemostasis. Clot retraction and dissolution. Anticoagulants. Blood types. Hemotransfusion. Resistance of the body to infection. Regulation of hemopoesis. | **2** | **1** |
| **XV week** | Lect. | Immunity. Leukocytes,characteristics and functions. | **1** | **1** |
| Pract. | The hemodynamics.Neural and hormonal control of smooth contraction | **2** | **1** |
| **XVI week** | Lect. | Immune reactions, allergic reactions. | **1** | **1** |
| Pract. | Blood groups. Hemostasis system. | **2** | **1** |
| **XVII- XVIII****week** | **Final Exam** | **2** |  |
| **XIX-XXweek** | **Additional exam** |  |  |