

EUROPEAN MEDICAL UNIVERSITY

“APPROVED”

Vice-rector of EMU,
MD, PhD, DrMedSc, Professor

_____Herman TITOV

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SYLLABUS OF THE EDUCATIONAL DISCIPLINE

"PHYSIOLOGY"

Cycle of Higher Education:	second cycle of higher education (Master's degree)
Field of Study:	22 «Healthcare»
Specialty	221 Dentistry
Educational qualification	Master of Dentistry
Professional qualification	doctor
Educational program	EPP «Dentistry» 2023
Department	Department of Fundamental Disciplines
Contact information	dp1funddis@dmitnm.edu.ua Akademician H. Dzyaka 3, St., Dnipro, 49005
Compilers of the syllabus	PhD., prof. associate Oleksandr TRUSHENKO Lecturer Natalia TERESHCHENKO

Dnipro

2024

1. Status and structure of the discipline

Discipline status	Mandatory
Discipline code in EPP/place of discipline in EPP	EC 9, professional training discipline
Course/semester	2 course (3-4 semester)
Course volume (total number of hours/ number of ECTS credits)	150 hours / 5 ECTS credits
Number of Chapter :	2
Number of content sections	5
Distribution by types of training and hours of study	Lectures 18 hours Practical classes 76 hours Independent work 56 hours
Language of instruction	English
Form of education	Full-time
Type of final control	Exam

2. Description of the discipline

Brief course summary, relevance.

Physiology is an academic discipline that provides an understanding of the formation of skills to apply knowledge of physiology in the process of further education and in professional activities and lays the foundations of a healthy lifestyle and prevention of dysfunction in the process of life.

Prerequisites. Physiology as an academic discipline is based on the knowledge acquired by students in the following disciplines: medical biology, medical and biological physics, medical chemistry, biological and bioorganic chemistry, morphological disciplines and is integrated with these disciplines; lays the foundations for students to study pathophysiology and propaedeutics of clinical disciplines.

The purpose of the course and its significance for professional activity. The purpose of teaching the academic discipline "Physiology" is to train a doctor in the specialty in accordance with the block of its content module (natural and scientific training) and is the basis for building the content of the academic discipline. The description of the goals is formulated through skills in the form of target tasks (actions). Based on the final goals, specific goals are formulated for each module or content module in the form of certain skills (actions), target tasks that ensure the achievement of the final goal of studying the discipline.

Postrequisites: knowledge, skills and abilities acquired by students after completing the study of the discipline "Physiology" create theoretical foundations for mastering the following non-clinical and clinical disciplines: Pathological physiology, surgical, therapeutic and orthopedic dentistry, pediatric dentistry, physical therapy and sports medicine, pathological anatomy, histology, pharmacology, human anatomy, nervous diseases with neurosurgery, biology, dentistry, physical therapy and sports medicine, propaedeutics of orthopedic dentistry, orthodontics, ophthalmology, otolaryngology, therapy, psychiatry, medical psychology, narcology, pediatric diseases, obstetrics, nervous diseases with neurosurgery, therapy.

3. Objectives of the discipline:

- 1) to study the basic concepts of general nosology: health, disease, pathological process, typical pathological process, pathological reaction, pathological condition, etiology, pathogenesis;
- 2) to explain the basic concepts of etiology: causal factors, risk factors, conditions of occurrence and development of the disease; 3) to analyze various options for the development of cause and effect relationships in pathogenesis;
- 4) evaluate the importance of modern research methods (experimental and clinical) for Physiology; 5) analyze the role of environmental factors in the occurrence of diseases;
- 6) explain the mechanisms of pathogenic action of physical, chemical and biological environmental factors;
- 7) to substantiate the cause and effect relationships, while separating local and general changes, pathological and adaptive-compensatory in the pathogenesis of manifestations of environmental factors (overheating, cooling, burns, frostbite, radiation sickness, decompression and compression diseases);
- 8) to define the concept and analyze typical disorders of immunological reactivity: immunodeficiency states, allergies, autoimmune reactions (diseases);
- 9) apply various principles to classify disorders of the immune system; 10) characterize the causative factors, risk factors and conditions of occurrence, mechanisms of development of typical disorders of the immune system;
- 11) analyze the causes, mechanisms of development and manifestations of infectious diseases;
- 12) analyze the mechanisms of cell damage in the pathogenesis of allergic and autoimmune reactions;
- 13) be able to analyze the cause and effect relationships in the pathogenesis of major disorders of the immune system.

4. Appointment of the discipline

Competencies

General competencies (GC): GC 1-3.

GC 1	Ability to think abstractly, analyze and synthesize. Ability to learn and develop.
GC 2	Knowledge and understanding of the subject area and understanding of the multi-level nature of professional activity.
GC 3	Ability to apply knowledge in practical activities.

Special (professional, subject) competencies (SC): SC 2, SC 5

SC 2	Ability to interpret the results of laboratory and instrumental studies.
SC 5	Ability to design the process of providing medical care: determine approaches, plans, types and principles of treatment of diseases of organs and tissues of the oral cavity and maxillofacial region.

Program learning outcomes (PLO): PLO 1-4.

PLO 1	To highlight and identify the leading clinical symptoms and syndromes (according to list 1), using preliminary data from the patient's history and disease, objective examination, to establish a probable nosological or syndromic preliminary clinical diagnosis of a dental disease (according to list 2).
PLO 2	Collect information about the patient's general condition and the condition of the maxillofacial organs, assess the patient's psychomotor and physical development. Based

	on the comprehensive diagnosis and the results of additional laboratory and instrumental studies, evaluate information regarding the diagnosis (according to list 5).
PLO 3	Assign and analyze the results of additional (mandatory and optional) examination methods (laboratory and instrumental) (according to list 5) of patients with diseases of the organs and tissues of the oral cavity and maxillofacial region for differential diagnosis of diseases (according to list 2).
PLO 4	Determine the final clinical diagnosis in compliance with relevant ethical and legal norms, by making a reasoned decision and logical analysis of the obtained subjective and objective data of clinical, additional examination, and differential diagnostics under the supervision of the head physician in a medical institution (according to list 2.1).

5. Content of the discipline

Lectures

№ 3/II	Topics	hours
Chapter 1 "General Physiology"		
1	Physiology as a science. Subject and tasks of physiology. Methods of physiological research. Electrical phenomena in excitable tissues.	
2	Physiology of neurons and nerve fibers. Conduction of excitation by nerve fibers and through the neuromuscular synapse.	2
3	Physiology of muscles. Properties and mechanisms of contraction and relaxation of skeletal muscles.	2
4	Final lesson on the topic "Physiology of excitable tissues". Test control and practical skills.	
5	Reflex principle of the activity of the CNS. Excitation and inhibition in the CNS. Coordination activity of the CNS.	2
Chapter 2: "Physiology of Visceral Systems"2		
6	Physiology of the blood system.	2
7	Physiology of the circulatory system	2
8	Physiology of the digestive system. Formation of the feeling of hunger and satiety	2
9	Physiology of the excretory system.	2
Total		18

Topics of seminar classes (not provided)

The topics of practical classes

Practical lessons

№	Topics	hours
Chapter 1 "General Physiology"		
1	Physiology as a science. Subject and tasks of physiology. Methods of physiological research. Electrical phenomena in excitable tissues.	2

2	Physiology of neurons and nerve fibers. Conduction of excitation by nerve fibers and through the neuromuscular synapse.	2
3	Physiology of muscles. Properties and mechanisms of contraction and relaxation of	2
4	Final lesson on the topic "Physiology of excitable tissues". Test control and practical	3
5	Reflex principle of the CNS. Excitation and inhibition in the CNS. Coordination activity of the CNS.	2
6	Research into the role of the spinal cord in the regulation of motor functions.	2
7	The role of the brainstem and cerebellum in the regulation of motor functions. The role of the vestibular sensory system.	2
8	The role of the thalamus, basal ganglia, cerebral cortex in the regulation of motor functions.	2
9	Final lesson on the topic "Physiology of the CNS" Test control and practical skills.	3
10	VND, conditioned reflexes. Emotions, motivation, memory.	2
11	Inhibition of conditioned reflexes. Features of higher nervous activity of a person, sleep.	3
12	General characteristics of sensory systems. Somatosensory system. Physiology of pain sensitivity. Physiology of visual and auditory sensory systems.	3
13	Final lesson on the topic "Physiology of sensory systems and human GNI" Test control	3
14	Research on the mechanisms of nervous regulation of visceral functions.	3
15	Research on the mechanisms of humoral regulation of visceral functions of the body.	3
16	Final lesson on the topic "The role of the ANS and endocrine system in the regulation of visceral functions of the body" Test control and practical skills.	3
Total Chapter 1		40
Chapter 2. "Physiology of visceral systems"		
17	Blood system. Study of the physicochemical properties of blood. Study of the number of erythrocytes and hemoglobin in the blood..	2
18	Protective functions of blood. Blood groups.	2
19	Types and physiological mechanisms of hemostasis. Physiology of platelets.	2
20	Practical skills and test control on the topic: "Physiology of the blood system".	2
21	Physiological properties of the heart. Pumping function of the heart. Regulation of heart activity. Study of the dynamics of cardiac excitation.	2
22	The role of vessels in blood circulation. Study of blood circulation regulation. Regulation of systemic hemodynamics and blood pressure	2
23	Methods of studying heart activity. ECG registration and analysis. Study of blood pressure in humans	2
24	Practical skills and test control on the topic: "Physiology of the cardiovascular system".	2

25	General characteristics of the respiratory system. External respiration. Study of diffusion, transport of gases by blood.	2
26	Research on the regulation of breathing.	2
27	Practical skills and test control on the topic "Physiology of the respiratory system"	2
28	General characteristics and functions of the digestive system. Digestion in the oral cavity. The role of the taste and olfactory sensory systems.	2
29	Digestion in the stomach.	2
30	Digestion in the intestines. The role of pancreatic juice and bile in the processes of digestion. Absorption processes. Physiological foundations of hunger and satiety.	2
32	The role of the kidneys in the processes of excretion. The participation of the kidneys in the regulation of homeostasis	2
33	Practical skills and test control on the topic "Physiology of the gastrointestinal tract. Physiology of the excretory system"	2
Total Chapter 2		36
Total Chapter 1, 2		76

Independent work.

№ з/п	Topics	hours
1	History of the development of physiology in the 19th century. Contribution of the works of I.M. Sechenov, I.P. Pavlov, Y.V. Chagovets, P.G. Kostyuk to the development of world physiology. Ukrainian physiological school. Ukrainian physiological school	5
2	Methodology of using direct current in the clinic (iontophoresis, diathermy, amplipulse)	5
3	Preparation for practical classes - theoretical training and development of practical skills	6
4	Vestibular sensory system	4
5	Mechanisms of smooth muscle contraction and their regulation"	4
6	Physiology of regional blood circulation	6
7	Dynamics of lymph circulation, composition of lymph and its quantity.	6
8	Study of respiratory regulation	4
9	Physiology of the blood system	5
10	Study of the gastrointestinal system and excretion	6
11	Preparation for the final certification class	5

Total	56
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Topics of the lecture course: reveal problematic issues in the relevant sections “Physiology”.

Practical classes provide theoretical justification of the main issues of the topic and acquiring **the following practical skills:**

Independent work of a student provides for preparation for practical classes and final control, studying topics for independent out-of-class work, preparing abstract reports, presentations, tables. Control of learning results of topics of independent out-of-class work is carried out during the class and during final control in the discipline.

Individual work includes the study of scientific literature, preparation of reviews on the submitted topics for presentation, implementation of scientific and practical research, participation in specialized competitions, scientific and practical conferences, competitions of student scientific papers.

Calendar plans of practical classes, thematic plan of independent extracurricular work, scope and directions of individual work are published on the website of the Department.

Route for receiving materials: Website of EMU /Student/ Department of Fundamental Disciplines / Educational and methodological support of the Department or follow the link Department of Fundamental Disciplines, discipline "Physiology". Materials are accessed from the student's Office 365-based corporate account.

6. Forms and methods of monitoring learning success

Current control in practical classes	Methods: individual oral survey, structured written works, test tasks with the choice of correct answers.
Control of mastering the thematic section of the discipline in intermediate control classes	Methods: oral or written survey, electronic testing, <i>methods of self-control and self-assessment</i> .
Final semester control	According to the regulation on control measures in EMU (regulation of EMU)

Final control of the discipline - <i>exam</i>	Methods: by exam cards in the form of an oral exam, monitoring of acquiring of practical skills (According to the Regulation on control measures in EMU (Regulation of EMU).
Tools for diagnosing learning success	Theoretical questions, tests, clinically oriented situational tasks, practical tasks, demonstration of practical skills.

7. Evaluation criteria

Knowledge assessment is carried out according to regulation on control measures in EMU ([regulation of EMU](#)).

Current control	According to the four-point system of traditional grades: 5 "Excellent", 4 "Good", 3 "Satisfactory", 2 "Unsatisfactory"
Control of practical skills	According to the four-point system of traditional grades
Exam	Based on a 200-point scale (the sum of points for the current academic activity of the student, the result of passing the exam and for successful completion of an individual task, if any) Credited: 120 to 200 points Not credited: less than 120 points (see Rating scale)
Final control for the discipline	The final control of students' academic performance is carried out after completing the study of the discipline and is implemented in the form of an exam.
Discipline assessment:	The score on the discipline is determined based on the results of assessment of current activities and is expressed using a fourpoint scale : ("Excellent", "Good", "Satisfactory", "Unsatisfactory"), multi-point scale and ECTS. The assessment in the discipline consists of an assessment of the current academic performance and the result of passing the exam (in points), which is set when evaluating theoretical knowledge and practical skills in accordance with the list defined by the discipline program. The number of points that the applicant scored for current academic.
	performance in the discipline is defined as the arithmetic mean of the number of points that the applicant received during the study of the discipline (practical, seminar, laboratory classes, etc.). The resulting value of the average traditional rating is converted to points according to the scale of conversion of traditional ratings to rating points. The maximum number of points is 200.

Matching grades on a 200-point scale, a 4-point (traditional) scale, and ECTS scale

On a 200-point scale	Rating on a 4-point scale
180–200	Excellent
140–179	Good
120–139	Satisfactory
0–119	Unsatisfactory

On a 200-point scale	ECTS evaluation
192–200	A
172–191	B
148–171	C
128–147	D
120–127	E
0–119	F

Discipline/course policy

The student has the right to receive high-quality educational services, access to up-to-date scientific and educational information, qualified advice during the study of the discipline and mastering practical skills. The policy of the department in the provision of Educational Services is student-centered, based on the regulatory documents of the Ministry of Education and the Ministry of Health of Ukraine, the Charter of the EMU and the procedure for providing educational services regulated by the regulation on the organization of the educational process in the EMU and the principles of academic integrity.

Compliance with the EMU schedule, safety precautions in the classroom.

Requirements for preparing for practical classes.

Students should arrive at classes on time, without being late. A student who is more than 10 minutes late for classes is not allowed in and must work it out in accordance with the established procedure. During practical classes, the student must wear a work uniform (medical gown, cap). Students who do not have a work uniform are not allowed to attend classes. The student must follow the safety rules during practical classes and while staying in the Department's premises. When discussing theoretical issues, students should demonstrate tolerance, politeness and respect for their colleagues and the teacher; when performing practical tasks, the workplace should be kept in order and cleaned after completing practical work.

Use of mobile phones and other electronic devices. The use of mobile phones and other electronic devices in the classroom is not allowed, only during Distance Learning, provided that it is technically necessary.

Academic integrity. When studying the discipline, the student should be guided by the following regulations: on academic integrity of EMU (regulation of EMU). In case of violation of the regulations of academic integrity during the current and final controls, the student receives a grade of "2" and must work it out to the teacher in accordance with the established procedure. Regulation on control measures in EMU (Regulation of EMU).

Skipping classes. Missed classes should be worked out in accordance with the procedure established in the regulations on control measures in the EMU (regulation of EMU) during the time determined by the work schedule (Department of Fundamental Disciplines) to the teacher on duty. To work out a missed lesson the student must pass a test and answer in writing or verbally the question on the topic of the lesson.

Procedure for admission to the final control in the discipline is given in the regulations on control measures and regulations on the organization of the educational process in the EMU (regulation of EMU) and regulations on control measures in the (regulation of EMU). Students who do not have missed not worked out practical classes and lectures and have received an average traditional grade of at least "3" are allowed to participate in the final control.

Additional individual points. Points are awarded subject to the mandatory participation of the head, head teacher and teacher. These points are encouraging and are added once to the total score of the current academic performance and the result of passing the comprehensive exam. Their total number for one student should not exceed 10, and the final amount of points for an academic discipline should not exceed 200 points.

Individual tasks include:

- 1) writing essays and creating multimedia presentations with reports at meetings of the student scientific group of the department – 3 points;
- 2) participation in the creation of tables, graphological structure, posters on the topics of practical classes – 2 points;
- 3) participation in the student competition in the discipline at the First Stage – 1 point;
- 4) participation/prize-winner of the All-Ukrainian student competition in the discipline - 7/10 points;
- 5) author or co-author of abstracts/article – 2/5 points;
- 6) author or co-author of an oral/information stand report at a scientific conference – 6/3 points;
- 7) author of a student scientific paper accepted for participation or awarded by a diploma of I-III degree in the All – Ukrainian competition of student scientific papers at Stage II - 8 (participation) or 10 (diploma) points.

Resolving conflict issues. If there are misunderstandings and complaints against the teacher due to quality of educational services provided, knowledge assessment, and other conflict situations, the student must first report his/her claims to the teacher. If the conflict issue is not resolved, the student has the right to submit an appeal to the head of the department in accordance with the

regulations on consideration of applications from applicants for higher education in EMU (regulation of EMU), Regulations on consideration of applications, complaints, and proposals of students in EMU (regulation of EMU), Regulations on meeting the requirements of the organization of the educational process (regulation of EMU), Regulation on the appeal of the results of the final control of knowledge of applicants for higher education in EMU (regulation of EMU), Regulations on safe educational environment in EMU (regulation of EMU).

Policy in the context of distance learning. The procedure for distance learning is regulated by regulation of EMU. The main training platforms for conducting training sessions are Microsoft Teams, Zoom. The procedure for conducting practical classes and lectures, working out and consultations during Distance Learning is published on the Department's Web page Department of Fundamental Disciplines. Feedback from the teacher is provided directly during the lesson and/or consultation, and is also possible via email (in case of force majeure) during working hours.

Training resources

Educational and methodological support of the discipline is published on the website of the Department (Department of Fundamental Disciplines). Consultations are held according to the consultation schedule.

Schedule and distribution of groups by teacher are published on the Department's Web page (Department of Fundamental Disciplines)

Questions for intermediate and final control of the discipline are published on the Department's Web page (Department of Fundamental Disciplines)

8. Recommended literature

1. Guyton and Hall. Textbook of Medical Physiology : 14th Edition: V. 1. - 2022. - 634 p.
2. Guyton and Hall. Textbook of Medical Physiology : 14th Edition: V. 2. - 2022. - 584 p.
3. Physiology : Textbook /Ed. By V.M. Moroz, O.A. Shandra. - Vinnitsa : Nova Knyha Publishers, 2011. - 888 pp.

Information resources:

<http://reftrend.ru/604585.htm>
<http://www.meddean.luc.edu>
<http://www.nphysiology.dp.ua>

Responsible for the course

Lecturer

Natalia TERESHCHENKO

Head of the department

Svitlana OSTROVSKA

ScD., Professor