	<p align="center">Educational Institution "Royal Metropolitan University"</p>
	<p align="center">Quality Management System Syllabus of the discipline "Normal Physiology" Specialty 560001 "General Medicine" EI "RMU"</p>

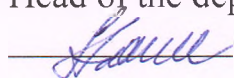
**Educational Institution "Royal Metropolitan University"  
Department "Morphological and Fundamental disciplines"**

**SYLLABUS  
in the discipline "Normal Physiology"  
for students of specialty 560001 "General Medicine"**

Form of study	full-time
Course	1
Semester	2
Exam	2
Total credits according to the curriculum	4
Total hours according to the curriculum	120
Lectures	36
Practical classes	36
Independent work	48

Syllabus developer:  
PhD Sadykova G.S.

Reviewed and approved at a meeting of the  
department of "Morphological and  
Fundamental disciplines"  
Protocol No. 1 from "9" September 2024.  
Head of the department PhD Jalilova A.A.



**Bishkek 2024**



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Specialty 560001 "General Medicine" EI "RMU"

**Teacher: G.S. Sadykova**

**Phone number: +996703838846 (WhatsApp)**

**e-mail: [goulnura@mail.ru](mailto:goulnura@mail.ru)**

### **Discipline labor input**

Year	Semester	Week	Academic hours		Independent work hours		Total hours	Mid-terms amount
			Lectures	Practical lessons	SIW	SIWT		
1	2	18	36	36	24	24	120	4

### **Annotation of the discipline**

"Normal physiology" is a fundamental experimental and theoretical science of the functioning of the whole organism, its physiological systems, organs, cells, and individual cellular structures, the mechanisms of regulation in the interaction of the organism with the environment, including the social environment. Physiology is the main base of medicine, as the great Russian physiologist Ivan Petrovich Pavlov said, as deep knowledge of physiology laws provides successful mastering of clinical disciplines. Physiology is the theoretical basis for the study of traditional and alternative methods of treatment, and methods of functional diagnostics.

### **The purpose of the discipline "Normal Physiology"**

Is to promote the formation of systemic knowledge about the vital activity of the whole organism and its parts, the basic regularities of functioning and mechanisms of their regulation in interaction with each other and with environmental factors, the study of the physiological basis of clinical and physiological methods of research used in functional diagnosis and the study of integrative human activity.

### **Objectives of the discipline:**

- ✓ to study methods and principles of research of assessment of the state of regulatory and homeostatic systems of the organism, used for diagnostic purposes in practical medicine;
- ✓ contribute to the formation of ideas about the structure and regularities of functioning of individual organs and systems of the organism, as well as about the work of the main regulatory mechanisms of physiological functions in the formation of holistic responses;
- ✓ contribute to the formation of a systemic approach to understanding the physiological mechanisms underlying the interaction with environmental factors and the implementation of adaptive strategies of the human body from the perspective of the concept of functional systems;



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- ✓ to familiarise with the experience of applying new scientific approaches to the practice of a general practitioner, based on the results of scientific research in related medical fields.

The planned results of mastering the study discipline "Normal Physiology" are determined by the competencies acquired by the student, i.e. his/her ability to apply knowledge, skills, and personal qualities to the objectives of the educational program and the tasks of professional activity.

After mastering the "Normal physiology" discipline students:

Will know:

- ✓ physiochemical basics and physiological properties of tissues, organs, and systems of the human body, regulation of their functions, comparative aspect of formation of functions;
- ✓ physiological processes and mechanisms of their regulation at the molecular, cellular, tissue, organ, and organismal levels, considered from the perspectives of general physiology, private physiology and integrative, human behavioral activity;
- ✓ about the theory of functional systems (P.K.Anokhin), mechanisms and features of the formation of functional systems of the organism (maintaining the constancy of the internal environment, the level of nutrients in the blood, arterial pressure, temperature of the internal environment, preservation of the integrity of the organism, etc.) in interaction with the external environment.


Will understand:

- ✓ basic principles of physiological equipment operation and safety rules when working with it;
- ✓ concept and methods of functional diagnostics, the essence of methods of research of various functions of a healthy organism used in medicine;
- ✓ general physiological laws underlying the processes occurring in the human body;
- ✓ basic mechanisms of regulation of physiological functions at molecular, cellular, tissue, organ, and organismal levels;
- ✓ basics of a healthy lifestyle of a person as a factor of his/her safe life activity;
- ✓ principles of interaction of the human body with the external environment.

Will be able to use:

- ✓ knowledge about the properties and functions of various body systems when analyzing the regularities of formation of functional systems of a healthy person's body depending on the conditions of its existence;
- ✓ skills in organizing one's activities, initiative, mobility, skills of preserving personal safety, interaction, and cooperation with others;
- ✓ skills of elementary statistical processing of experimental data;
- ✓ educational, scientific, popular science literature, the Internet for up-to-date information on normal physiology.



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Will be able to analyze:

- ✓ regulation of activity of different systems of the organism at different functional conditions;
- ✓ dynamics of physiological processes under different types of stress;
- ✓ interpret the results of modern methods of functional and laboratory diagnostic methods to identify pathological processes in human organs and systems;
- ✓ explain the informational value of various indicators and mechanisms of regulation of organs, systems, and whole organism activity.

Will be able to synthesize:


- ✓ qualitative and quantitative assessment of the most important physiological indicators of the activity of various organs and systems at rest and under load, as well as to identify the main mechanisms of regulation of homeostatic functions.

Will be able to assess:

- ✓ results of the most common methods of functional diagnostics used to detect pathology of blood, heart and vessels, lungs, kidneys, liver and other organs and systems;
- ✓ data and phenomena obtained from experiments and laboratory work, using modern methodological principles.


Will be able to conduct research:

- ✓ using physical, chemical, biochemical and electrophysiological equipment.

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**Course content**

№	Names of units and topics of the discipline	Classroom lessons				Total classroom hours	SIWT	SIW	Formed competencies	Used educational technologies	Forms of current and milestones control	Normal physiology laboratory
		lectures	seminars	Practical lessons	Laboratory works							
CVS physiology. Respiratory physiology.												
1	Properties of cardiac muscle. ECG basics.	2		1	1	4	1	1	IC-2, PC-15	Presentation lecture, educational video film, laboratory work, report, paper work.	Oral survey, SIW control, demonstration of practical skills	ECG

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2	Cardiac cycle. Heart tones.	2		1	1	4	1	2	IC-2, PC-15	Presentation lecture, multimedia lecture, report, "yes-no" method, paper, laboratory work, TBL, PBL.	Oral survey, SIW control, demonstration of practical skills	tonometer, fonendoscope
3	Hemodynamics. Functional role of blood vessels.	2		1	1	4	2	1	IC-2, PC-15	Presentation lecture, multimedia lecture, report, laboratory work, control task, analytical work.	Oral survey, SIW control	pulsoxymeter
4	Regulation of cardiac activity and BP.	2			2	4	1	2	IC-2, PC-15	Presentation lecture, multimedia lecture, paper work, laboratory work, TBL, PBL	Oral survey, SIW control, demonstration of practical skills	pulsoxymeter, tonometer





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7	Basic principles of digestion. Digestion in the oral cavity and stomach.	2		1	1	4	1	2	IC-2, PC-15	Presentation lecture, multimedia lecture, report, laboratory work, TBL, PBL	Oral survey, SIW control	
8	Digestion and absorption in small intestine. Pancreas, liver and bile.	2		2		4	1	1	IC-2, PC-15	Presentation lecture, multimedia lecture, analytical work, report, laboratory work, TBL, PBL	Oral survey, SIW control	
9	Digestion and absorption in large intestine. Metabolism and energy balance.	2		2		3	1		IC-2, PC-15	Presentation lecture, multimedia lecture, analytical work, report, laboratory work, TBL, PBL	Oral survey, SIW control	





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10	Thermoregulation.	2		1	1	3	1	1	IC-2, PC-15	Presentation lecture, multimedia lecture, paper work, report, laboratory work, TBL, PBL	Oral survey, SIW control, demonstrati on of practical skills	thermomete r
11	Excretion physiology. GFR.	2		2		4	1	1	IC-2, PC-15	Presentation lecture, multimedia lecture, analytical work, report, laboratory work, TBL, PBL, MCQ testing	Oral survey, SIW control	



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12	Tubular reabsorption and secretion. Urine.	2		1	1	4	2	2	IC-2, PC-15	Presentation lecture, multimedia lecture, analytical work, report, laboratory work, control task, TBL, PBL	Oral survey, SIW control	urine analyzer
13	Acid-base balance.			1		1	2	1	IC-2, PC-15	Presentation lecture, multimedia lecture, analytical work, paper work, control task, laboratory work, TBL, PBL	Oral survey, SIW control	
	<i>Модуль 2</i>		1			1					MCQ testing, oral survey, SIW control	



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14	Higher nervous activity. Conditioned and unconditioned reflexes.	2		2		4	1	1	IC-2, PC-15	Presentation lecture, "yes-no" method, analytical work, paper work, control task	Oral survey, SIW control	
15	Physiological basics of psychological processes: perception, motivation, thinking.	2		2		2	1	1	IC-2, PC-15	Presentation lecture, "yes-no" method, report, paper work, TBL, PBL	Oral survey, SIW control	
16	Physiology of sleep. Dreams.	2		2		4	1	1	IC-2, PC-15	Presentation lecture, round table, report, paper work, TBL, analytical work	Oral survey, SIW control	
17	Physiological basis of learning and memory.	2		2		2	1	1	IC-2, PC-15	Presentation lecture, paper work, game class	Oral survey, SIW control	



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18	Physiology of adaptational processes.	2			2	2	1	1	IC-2, PC-15	Presentation lecture, PBL	Oral survey, SIW control	
	<i>Module 3</i>		1			1			IC-2, PC-15		MCQ testing, oral survey, SIW control	
	<b>Total for 2<sup>nd</sup> semester</b>	<b>27</b>	<b>3</b>	<b>22</b>	<b>11</b>	<b>63</b>	<b>21</b>	<b>21</b>				





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## **Guidelines for students on studying the discipline and performing control tasks.**

The study of the theoretical part of the disciplines is designed not only to deepen and consolidate the knowledge obtained in classroom classes, but also to promote the development of students' creative skills, initiative and organise their time.

The material covered in the lectures should be regularly reviewed and supplemented with information from other sources of literature, presented not only in the discipline programme, but also in periodicals.

When studying the discipline it is necessary to read the recommended literature on each topic and make a brief outline of the main provisions, terms, information that require memorisation and are fundamental in this topic for mastering the subsequent topics of the course. To expand knowledge of the discipline it is recommended to use Internet resources; to conduct searches in various systems and use the materials of sites recommended by the teacher.

Each student keeps a workbook, the design of which must meet the requirements, the main ones of which are as follows:

- on the title page indicate the subject, course, group, surname, first name of the student;
- each work is numbered in accordance with the methodological guidelines, indicate the date of work completion;
- fully write down the title of the work, the purpose and principle of the method, briefly characterise the progress of the task and the object of research;
- if necessary, provide a graphical representation; the results of the tasks are presented in the form of graphical images with mandatory captions to them, as well as tables or described verbally;
- at the end of each activity, draw a conclusion or conclusion, which is discussed when summarising the results of the lesson.

All primary notes should be made in a notebook as the tasks are completed.

To check the academic activity and quality of the student's work, the workbook is periodically checked by the teacher.

The material covered in the lectures should be regularly reviewed and supplemented with information from other sources of literature, presented not only in the discipline programme, but also in periodicals.

When studying the discipline it is necessary to read the recommended literature on each topic and make a brief outline of the main provisions, terms, information that require memorisation and are fundamental in this topic for mastering the subsequent topics of the course. To expand the knowledge of the discipline it is recommended to use Internet resources; conduct searches in various systems and use the materials of the sites recommended by the teacher.



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### **Guidelines for practical/seminar classes and laboratory works.**

Practical classes are held after lectures, and are of clarifying, generalizing and consolidating nature. They can be held not only in the classroom but also outside the educational institution.

During practical classes students perceive and comprehend new educational material. Practical exercises are systematic, regularly following each lecture or two or three lectures. Practical classes are carried out according to the schedule of the educational process and the independent work of students on disciplines.

When preparing for practical classes it is necessary to study in advance the methodological recommendations for its implementation. Pay attention to the purpose of the class, to the main questions to prepare for the class, to the content of the topic of the class.

Before each practical lesson the student studies the plan of the seminar with the list of topics and questions, the list of literature and homework on the material presented at the seminar. The student is recommended to prepare for the workshop as follows:

1. work through the lecture notes;
2. to read the main and additional literature recommended for the studied section.
3. to answer the questions of the seminar plan;
3. answer the questions of the plan of the seminar class;
4. to study the topics and select literature for writing essays, reports, etc.;

### **Guidelines for the completion of independent work.**

When studying the discipline "Normal Physiology" the following types of independent work of students are applied:

- study of theoretical material on lecture notes and recommended textbooks, educational literature, and reference sources.
- study of theoretical material on lecture notes and recommended textbooks, educational literature, and reference sources;
- independent study of some theoretical issues not covered in the lectures, with the writing of essays, and preparation of presentations;

Students are offered to read and analyze monographs and scientific articles on public health issues. The results of work with texts are discussed in practical classes.

To develop skills of independent work, students perform tasks, independently referring to educational, reference, and scientific-methodological literature. Assignments are checked both at practical classes using students' oral presentations and their collective discussion and using written independent work.

Independent work contributes to the student's development of such necessary skills as the choice and solution of the task, collection and analytical analysis of published data, and the ability to highlight the main things and make a reasonable conclusion.



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## Organization of students' independent work

№	Theme of the students' work	Students' work task (essay, report, abstract, tables, presentation, note-taking, extracts, crosswords, solving situational problems, exercises, cases, preparing for business games, testing on the topic)	Form of students' work	Deadlines (number of week)
1.	Anomalies in the development of the heart.	<ol style="list-style-type: none"> <li>1. Formation of the heart</li> <li>2. Small anomalies of heart development</li> <li>3. Congenital malformations of the heart</li> <li>4. Heart defects</li> </ol>	Abstract	1-2
2.	The influence of physical activity on the development and work of the heart.	<ol style="list-style-type: none"> <li>1. Mechanisms of the influence of movements on the body</li> <li>2. The effect of physical activity on the muscles of the cardiovascular system</li> <li>3. Types of CVS responses to exercise</li> <li>4. Muscle blood flow and cardiac output during sports</li> <li>5. Regulation of blood flow in skeletal muscles at rest and during exercise</li> </ol>	Solving ST	3-4
3.	The influence of mental activity and emotions on the cardiovascular system and pathology.	<ol style="list-style-type: none"> <li>1. Influence of emotions on the heart</li> <li>2. Methods for relieving emotional stress</li> </ol>	Essay	3-4
4.	Comparative characteristics of the excitability of skeletal muscles and cardiac muscle.	<ol style="list-style-type: none"> <li>1. Comparative characteristics of skeletal, smooth and cardiac muscles.</li> <li>2. Features of excitability, conduction and contractility of skeletal muscle</li> <li>3. Features of excitability, conduction and contractility of smooth muscle</li> <li>4. Features of excitability, conduction and contractility of the heart muscle</li> </ol>	Mind map	1-2
1.	Cardiac activity	<ol style="list-style-type: none"> <li>1. Functions of the heart.</li> <li>2. Cardiac cycle.</li> <li>3. The value of the conducting system of the heart. Automation of the heart.</li> <li>4. Heart rate. Pacemaker.</li> <li>5. Methods of research of heart activity.</li> <li>6. Registration and analysis of electrocardiography</li> </ol>	Case study	3-4
5.	Modern ideas about the mechanisms of cardiac muscle automatism.	<ol style="list-style-type: none"> <li>1. Automation of the heart muscle: causes and features.</li> <li>2. The degree of automation of various parts of the heart.</li> <li>3. Experience of Stannius.</li> </ol>	Paper	5-6





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2.	Mechanisms of regulation of cardiac activity	<ol style="list-style-type: none"> <li>1. Functions of the heart.</li> <li>2. Cardiac cycle and its phases.               <ol style="list-style-type: none"> <li>1. Efferent regulation of cardiac activity.</li> <li>2. The role of various parts of the brain in the regulation of the heart.</li> <li>3. Intercardial reflexes and their meaning.</li> <li>4. Humoral mechanisms of regulation of heart activity.</li> <li>5. Autoregular mechanisms. Self-regulation of heart contractions. O. Frank and E. Starling's law.</li> </ol> </li> </ol>	Cahoot	5-6
6.	Modern methods for the study of cardiac activity.	<ol style="list-style-type: none"> <li>1. ECG as one of the informative methods for studying the properties of the heart.</li> <li>2. Auscultation of heart sounds</li> <li>3. Phonocardiogram as a method for examining the heart.</li> </ol>	Video presentation	5-6
3.	The movement of blood in the cardiovascular system	<ol style="list-style-type: none"> <li>1. Hemodynamics - the doctrine of the movement of blood in the cardiovascular system.</li> <li>2. Functional classification of vessels.</li> <li>3. The movement of blood through the arteries.</li> <li>4. The movement of blood through the capillaries.</li> <li>5. The movement of blood through the veins.</li> <li>6. Regulation of vascular tone.</li> </ol>	Video presentation	7-8
4.	Blood pressure regulation mechanisms	<ol style="list-style-type: none"> <li>1. The value of blood pressure.</li> <li>2. Physiological mechanisms of nervous regulation of blood pressure.</li> <li>3. Own and associated reflexes of the vascular system.</li> <li>4. The humoral mechanism of blood pressure regulation.</li> <li>5. Mechanisms of blood pressure regulation when changing body position, during muscular work.</li> <li>6. Measurement of blood pressure</li> </ol>	MCQ	7-8
7.	The role of the pleural cavity in the biomechanics of respiration.	<ol style="list-style-type: none"> <li>1. Mechanisms of external respiration</li> <li>2. Pressure in the pleural cavity, its origin</li> <li>3. Changes in pleural pressure during breathing and the role of the mechanism of external respiration</li> <li>4. Pneumothorax</li> </ol>	Paper	7-8
8.	Lung surfactant and its importance for	<ol style="list-style-type: none"> <li>1. Surfactant lung system, composition, role</li> <li>2. Elastic traction of the lungs</li> </ol>	Paper	7-8





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	respiration.	3. The elastic resistance of the lungs		
9.	Features of pulmonary ventilation at rest and during exercise.	<ol style="list-style-type: none"> <li>1. Pulmonary volumes</li> <li>2. Lung capacity</li> <li>3. Anatomical and physiological dead space</li> <li>4. Maximum and alveolar ventilation of the lungs</li> <li>5. Obstructive and restrictive lung diseases</li> </ol>	Case study	8-9
5.	Gas exchange in the human body	<ol style="list-style-type: none"> <li>1. The meaning of breathing. External and internal breathing.</li> <li>2. Conditions conducive to gas exchange in the lungs. Potential reserves of pulmonary gas exchange.</li> <li>3. The vital capacity of the lungs.</li> <li>4. Gas composition of human blood and higher vertebrates.</li> <li>5. The relationship between the intensity of external respiration and blood gas composition.</li> <li>6. Determination of vital capacity of the lungs and its constituent volumes using a spirometer</li> </ol>	MCQ	8-9
10.	Breathing in different conditions	<ol style="list-style-type: none"> <li>1. Breathing at elevated atmospheric pressure</li> <li>2. Specific conditions in submarines</li> <li>3. Toxicity of oxygen at high pressure</li> <li>4. Decompression sickness</li> </ol>	Abstract	8-9
11.	The effect of low oxygen pressure on the body.	<ol style="list-style-type: none"> <li>1. Breathing at reduced atmospheric pressure</li> <li>2. Artificial climate in a spaceship</li> <li>3. Acute and chronic manifestations of hypoxia</li> <li>4. Breathing during physical exertion</li> </ol>	Abstract	8-9
12.	Natural acclimatization of the indigenous people living at high altitudes.	<ol style="list-style-type: none"> <li>1. Mechanisms of natural acclimatization to high mountain conditions (Tien Shan, Tibet and Himalayas)</li> <li>2. Acute altitude sickness and high-altitude pulmonary edema</li> <li>3. Chronic mountain sickness</li> </ol>	paper	7-8
13.	The effect of aging on the respiratory system.	<ol style="list-style-type: none"> <li>1. Age-related anatomical and morphological changes in the respiratory system</li> <li>2. The state of the small circle of blood circulation</li> <li>3. Changes in the ventilation function of the lungs</li> <li>4. Features of breathing regulation</li> </ol>	Picha Cucha Presentation	8-9



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14.	Gas exchange regulation mechanisms	<ol style="list-style-type: none"><li>1. Concept of the respiratory center. The role of CO<sub>2</sub> and O<sub>2</sub> in the regulation of respiration.</li><li>2. Significance in respiration of impulses from the receptors of the lungs, respiratory muscles, airways and skeletal muscles.</li><li>3. Features of the process of self-regulation of respiration.</li><li>4. The role of the cerebral cortex in the regulation of respiration.</li><li>5. Regulation of breathing during muscular work, at low and high atmospheric pressure.</li></ol>	Mind map	8-9
15.	The mechanisms of absorption of substances in the gastrointestinal tract.	<ol style="list-style-type: none"><li>1. Absorption of nutrients in different parts of the gastrointestinal tract</li><li>2. Passive suction mechanisms</li><li>3. Active mechanisms of absorption</li><li>4. Suction regulation</li></ol>	Case study	9-10
16.	Digestion in the mouth	<ol style="list-style-type: none"><li>1. Salivary glands of the oral cavity. Saliva composition and its importance in digestion.</li><li>2. The effect of the sympathetic and parasympathetic systems on the nature of salivation.</li><li>3. Center of salivation. The difference between the unconditional and conditioned reflex character of salivation.</li><li>4. Influence of humoral factors on salivation.</li><li>5. Reflex chewing and swallowing mechanism.</li><li>6. The breakdown of starch by saliva enzymes</li></ol>	Quiz game	9-10
17.	Modern experimental methods for studying the activity of the digestive system.	<ol style="list-style-type: none"><li>1. Sharp experiences</li><li>2. Method of chronic experiment</li><li>3. Sounding</li><li>4. Radiography</li><li>5. Endoscopy</li><li>6. ultrasound</li><li>7. Scanning tomography</li><li>8. Electronic methods</li></ol>	Paper	9-10
18.	Digestion in the stomach	<ol style="list-style-type: none"><li>1. Glands of the stomach and features of their structure.</li><li>2. Composition and value of gastric juice.</li><li>3. Reflex mechanism of gastric secretion regulation.</li><li>4. Humoral regulation of gastric secretion.</li></ol>	Picha Cucha Presentati on	9-10



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		5. Influence of gastric juice on milk proteins		
19.	Regulation of gastric secretion.	<ol style="list-style-type: none"> <li>1. Phases of gastric secretion</li> <li>2. Cerebral phase of gastric secretion</li> <li>3. Gastric phase</li> <li>4. Intestinal phase of gastric secretion</li> <li>5. Method of obtaining gastric juice</li> </ol>	Video presentation	9-10
20.	Intestinal digestion	<ol style="list-style-type: none"> <li>1. Composition of pancreatic juice, intestinal juice and bile.</li> <li>2. Digestion in the small intestine.</li> <li>3. Digestion in the colon.</li> <li>4. The process of suction, its mechanism.</li> <li>5. Reflex and humoral mechanisms of regulation of the pancreas, small intestine glands, bile formation and bile secretion.</li> </ol>	Animation	11-12
21.	Digestion in the small intestine	<ol style="list-style-type: none"> <li>1. Intracellular, intracavitary and membraneous digestion.</li> <li>2. Features of the structure of the inner layer of the intestinal wall and its significance.</li> <li>3. The process of absorption and its mechanisms.</li> <li>4. Nervous regulation of the activity of the glands of the small intestine.</li> <li>5. Humoral regulation of the secretion of intestinal glands.</li> </ol>	MCQs	11-12
22.	Physiological bases of hunger and satiety	<ol style="list-style-type: none"> <li>1. Theories of the onset of hunger</li> <li>2. Mechanisms of hunger development</li> <li>3. Primary saturation</li> <li>4. Secondary saturation</li> <li>5. Centers of hunger and satiety</li> </ol>	Abstract	11-12
23.	The microflora of the large intestine.	<ol style="list-style-type: none"> <li>1. Formation of microflora of the gastrointestinal tract</li> <li>2. Types of microorganisms in the intestine, their role</li> <li>3. Violations of microflora</li> <li>4. Improvement of intestinal microflora</li> <li>5. Methods for determining the intestinal microbiota</li> </ol>	Animation	12-13
24.	The motor function of the digestive tract	<ol style="list-style-type: none"> <li>1. The structure of the walls of various parts of the alimentary canal.</li> <li>2. The mechanism of the act of chewing and swallowing.</li> <li>3. Motor activity of the stomach.</li> <li>4. Motor activity of the small and large intestines.</li> <li>5. Regulation of the motility of the digestive tract.</li> </ol>	Poster	12-13





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25.	Protein metabolism and the mechanism of its regulation	<ol style="list-style-type: none"><li>1. The value of proteins and the characteristic feature of their chemical composition.</li><li>2. Specificity of protein synthesis in various tissues.</li><li>3. The dynamic state of anabolism and catabolism of proteins in the body.</li><li>4. Dissimilation of proteins in the body. Nitrogen balance.</li><li>5. Mechanisms of regulation of protein metabolism.</li><li>6. Drawing up a food ration</li></ol>	Abstract	12-13
26.	Lipid metabolism and its regulation	<ol style="list-style-type: none"><li>1. The value of lipids in the body.</li><li>2. Absorption of fats. The role of bile in the digestion of fats.</li><li>3. Dissimilation of fats.</li><li>4. Interconversion of organic substances.</li><li>5. Regulation of fat metabolism.</li><li>6. Drawing up a food ration</li></ol>	Paper	13-14
27.	The role of vitamins in the life of the body	<ol style="list-style-type: none"><li>1. The role of vitamins. Hypovitaminosis, hypervitaminosis, vitamin deficiency.</li><li>2. Classification of vitamins.</li><li>3. The functional value of water-soluble vitamins.</li><li>4. The functional significance of fat-soluble vitamins.</li><li>5. The body's daily needs for essential vitamins.</li></ol>	Paper	13-14
28.	Physiology of nutritional needs and the problem of maintaining a normal body weight	<ol style="list-style-type: none"><li>1. Exchange of substances and energy. Types of exchange (basic, working, daily).</li><li>2. Unconditioned and conditioned reflexes of digestion. Age and individual characteristics.</li><li>3. Conditioned food reflexes to time, space and information.</li><li>4. Emotional food addiction and biological nutritional need</li><li>5. The role of behavior motivation in maintaining normal body weight.</li></ol>	Abstract	13-14
29.	Energy exchange	<ol style="list-style-type: none"><li>1. Biochemical transformations are the basis of energy metabolism.</li><li>2. Research of the body's energy expenditures.</li><li>3. Assessment of the amount of energy consumption for consumed by the body O<sub>2</sub> and released CO<sub>2</sub>.</li></ol>	Essay	14-15





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		4. Basic exchange. 5. Daily expenditure of energy for people of different professions. 6. Calculation of the basic exchange in tables		
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### SSTs FOR 3-4-MODULES

Assignment submission format– project-based learning

One group is divided into two subgroups.

Choose a topic and type of project implementation

1. **The Information project** is aimed at collecting information about a topic in order to analyze, summarize, and present information to a wide audience. The final product of an information project can be video clips, animation, information cards, a newspaper, a magazine; an excursion; a collection; a multimedia product; a forecast; a directory; a Website, a mini-movie, etc. Steps and implementation of the project

- topic selection
- planning project stages and distribution of responsibilities
- Information search
- creation of an information product
- Project design
- presentation of the project and product
- Application of the information product

2. **Research project** - a project aimed at proving or refuting a hypothesis, or investigating a problem. Content of the research project:

- an explanatory note with a rationale for the relevance of the topic, the definition of a scientific problem;
- definition of the subject and object of research, goals and objectives, research methods
- historical digression into the problem based on the theoretical analysis of scientific classical literature;
- the current state of the problem based on the analysis of domestic and foreign scientific periodicals;
- possible prospects for further development of this scientific direction;
- personal attitude of the group to the issue under study.
- Conclusions and list of sources used
- Applications (if available)

The product of the project activity can be analytical materials, review materials, poster presentation, article,

3. **Creative project** - a project aimed at creating some kind of innovative product; a project that involves



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a free, non-standard approach to the design and presentation of the results of work. These can be theatrical performances, sports games, works of fine or decorative art, video films, costumes; model or layouts; musical composition; verse, an exhibition of drawings; video clips; organization of a holiday; a game; or a collection.

3. **Social (social-oriented) project** - a project aimed at increasing the civic activity of students and the population; a project involving collecting, analyzing, and presenting information on some topical socially significant topic. The product of such a project can be a video product, animation, information cards, a newspaper, a

The project must have an explanatory note (theoretical part) with the following structure:

- Title page.
- Table of contents (list of parts of the project).
- Introduction (relevance, topic, purpose, and tasks of the project are indicated)
- Main body (chapters, sections, paragraphs)
- Conclusion
- List of used sources
- Applications (if available)

1. Role of the kidneys in homeostasis	<ol style="list-style-type: none"><li>1. Function of the kidneys as the main organ of homeostasis.</li><li>2. The process of urine formation.</li><li>3. Composition of urine.</li><li>4. Antidiuretic mechanism for maintaining water-salt balance.</li><li>5. The role of the kidneys in the acid-base balance.</li><li>6. Regulation of urine formation.</li></ol>
2. Renin-angiotensin-aldosterone system.	<ol style="list-style-type: none"><li>1. Functional significance of RAAS</li><li>2. Components of the renin-angiotensin-aldosterone system</li><li>3. Secretion of renin, angiotensin and aldosterone, their control</li><li>4. The mechanism of action of the renin-angiotensin-aldosterone system in the regulation of blood pressure</li><li>5. RAS and Covid 19</li></ol>
3. Features of urination in newborns.	<ol style="list-style-type: none"><li>1. Age features of the urinary system in children</li><li>2. Physiological aspects of urination in young children</li><li>3. Research methods</li><li>4. Damage to the kidneys and urinary tract</li></ol>
4. Acid-base abnormalities	<ol style="list-style-type: none"><li>1. Acid-base balance</li><li>2. Respiratory acidosis</li><li>3. Respiratory alkalosis</li><li>4. Metabolic acidosis</li><li>5. Metabolic alkalosis</li></ol>
5. Buffer systems of blood.	<ol style="list-style-type: none"><li>1. The role of blood buffer systems in maintaining acid-base balance</li><li>2. Bicarbonate buffer system</li><li>3. Phosphate buffer system</li><li>4. Protein and hemoglobin buffer systems</li></ol>
6. Adaptive reactions of the body	<ol style="list-style-type: none"><li>1. Characteristics and classification of adaptive mechanisms</li><li>2. Stressors and stages of body resistance</li></ol>



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		<ol style="list-style-type: none"> <li>1. Nonspecific protective and adaptive reactions.</li> <li>3. Specific adaptive reactions.</li> <li>4. Adaptation to physical activity and hypokinesia</li> <li>5. The essence of improving the adaptive physiological mechanisms.</li> </ol>
7.	Biological rhythms	<ol style="list-style-type: none"> <li>1. Characteristics of biorhythms and their classification</li> <li>2. The biological clock</li> <li>3. Biorhythms and performance</li> </ol>
8.	Motivations and their biological significance.	<ol style="list-style-type: none"> <li>1. Need as the main driving force of human behavior</li> <li>2. Motivation is a factor in the organization of behavior.</li> <li>3. Central mechanisms of motivation.</li> <li>4. The theory of functional systems and motivation.</li> </ol>
9.	Integrative activity of the brain. Consciousness.	<ol style="list-style-type: none"> <li>1. Theory of A.P. Pavlov: excitation and inhibition as the basis of individual differences.</li> <li>2. Laws of propagation of excitation in the nervous system.</li> <li>3. Interaction of excitation and inhibition in the nervous system</li> <li>4. The concept of a dynamic stereotype.</li> <li>5. Dominant theory (A.A. Ukhtomsky), physiological properties and biological significance.</li> <li>6. Developing the skill of mirror writing as an example of the destruction of the old and the formation of a new dynamic stereotype</li> <li>7. Studying the features of thinking</li> </ol>
10	Unconditioned reflexes.	<ol style="list-style-type: none"> <li>1. Hierarchy of innate reactions of the body.</li> <li>2. Congenital and acquired forms of behavior: similarities and main differences.</li> <li>3. General characteristics of unconditioned reflexes, and their classification.</li> <li>4. The most complex unconditioned reflexes (instincts, emotions, motivation, imprinting).</li> <li>5. Observation of the simplest unconditioned reflexes</li> </ol>
11	Conditioned reflex activity as a mechanism of higher mental activity	<ol style="list-style-type: none"> <li>1. Conditioned reflexes, types: development rules, classification.</li> <li>2. The mechanism of formation of a temporary connection. Formation of a conditioned reflex.</li> <li>3. Development of a blinking conditioned reflex in humans.</li> <li>4. Modification of conditioned reflexes, types of inhibition.</li> <li>5. Development of a conditioned reflex, differentiate inhibition and extinction to a verbal stimulus</li> <li>6. Classical and instrumental conditioned reflexes.</li> </ol>
12	Functional structure of the central nervous system.	<ol style="list-style-type: none"> <li>1. Modern ideas about the localization of function in the cerebral cortex.</li> <li>2. Projection zones of the cortex.</li> <li>3. The closing conditioned connection mechanisms</li> <li>4. The PK Anokhin theory of functional systems.</li> <li>5. The formation of the behavioral act.</li> </ol>





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13	Physiological mechanisms of memory.	<ol style="list-style-type: none"> <li>1. Memory, classification</li> <li>2. Physiological mechanisms of short-term and long-term memory. Sensory memory.</li> <li>3. Visual and auditory sensory registers.</li> <li>4. Forgetting curve theory.</li> <li>5. Memory pathologies: amnesia, hypermnesia</li> <li>6. The study of short-term and long-term human memory</li> <li>7. Memory improvement</li> </ol>
14	Speech.	<ol style="list-style-type: none"> <li>1. Functions of speech. Types of speech.</li> <li>2. Physiological bases of speech. Interaction of 1 and 2 signal systems.</li> <li>3. The value of the second signal system in the organization of human behavior.</li> <li>4. Brain centers of speech. Mechanisms of speech perception.</li> <li>5. The development of speech in a child</li> <li>6. Development of a conditioned reflex, differentiate inhibition and extinction to a verbal stimulus</li> <li>7. Functional interhemispheric asymmetry of the brain</li> </ol>
15	The biological role of emotions and their physiological expression.	<ol style="list-style-type: none"> <li>1. Emotions - the definition of the concept, the classification of emotional states.</li> <li>2. The central mechanisms of emotion.</li> <li>3. Physiological expression of emotions</li> <li>4. The role of emotions in the organization of behavior</li> <li>5. Emotional Status Study</li> </ol>
16	Stress	<ol style="list-style-type: none"> <li>1. Stress, its types, stages and mechanisms.</li> <li>2. Influence of stress on performance efficiency, cognitive and integrative processes.</li> <li>3. Effect of stress on human behavior and activities</li> </ol>
17	The higher nervous activity	<ol style="list-style-type: none"> <li>4. Characteristics of higher nervous activity types according to I.P. Pavlov</li> <li>5. Properties of the nervous system</li> <li>6. Classification of HNA types. Determination of individual features of HNA.</li> <li>7. Temperament types. Determination of temperament according to the Eysenck questionnaire.</li> <li>8. Relationship of student's achievement with of individual HNA typological features.</li> <li>9. Violations of higher nervous activity. Neuroses, their development</li> </ol>
18	I.P. Pavlov's theory of higher nervous activity	<ol style="list-style-type: none"> <li>1. The essence of Pavlov's theory and the concept of higher nervous activity</li> <li>2. A new stage in the study of brain physiology</li> <li>3. Methods for studying Pavlov's HNA</li> <li>4. I.P. Pavlov's theory based on the types of higher nervous activity</li> </ol>





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19	Concepts and principles of higher nervous activity.	<ol style="list-style-type: none"><li>1. The history of the development of the science of HNA.</li><li>2. Galen's research.</li><li>3. The concept of a reflex in Descartes' physics.</li><li>4. The concept of I. Prochazka.</li><li>5. I.M. Sechenov's theory in the field of physiology of the central nervous system.</li></ol>
20	Methods for studying the physiology of HNA	<ol style="list-style-type: none"><li>1. Modern methods for studying HNA</li><li>2. EEG registration</li><li>3. Study of the lability of the nervous system</li></ol>
21	Sleep and dreams	<ol style="list-style-type: none"><li>1. Types and duration of sleep.</li><li>2. Sleep research methods.</li><li>3. Modern theories of sleep: humoral and nervous. Serotonergic theory of sleep and wakefulness. Reticular theory of sleep and wakefulness</li><li>4. Sleep/wake regulation system</li><li>5. Sleep and memory</li><li>6. Physiological mechanisms of dreams.</li><li>7. Sleep pathologies</li></ol>

### **Guidelines for papers, reports, crossword puzzles and abstracts.**

*Paper* - a brief written summary of the content of scientific work on a given topic. This is an independent research work, where the student reveals the essence of the researched problem with elements of analysis on the topic of the abstract.

Gives different points of view, as well as their own views on the problems of the topic of the abstract. The content of the abstract should be logical, the presentation of the material should be of a thematic and problematic nature.

Requirements for the design of the abstract:

The volume of the abstract may vary within 9-10 printed pages.

The main sections: table of contents (outline), introduction, main content, conclusion, list of references.

The text of the abstract should contain the following sections:

- title page indicating: name of the university, department, topic of the abstract, name of the author and name of the teacher
- introduction, relevance of the topic.
- main section.
- conclusion (analysis of the results of the literature search); conclusions.
- the list of literary sources should have at least 10 bibliographic titles, including network resources.

The text part of the abstract is drawn up on a sheet of the following format:

- top indent - 2 cm; left indent - 3 cm; right indent - 1.5 cm; bottom indent - 2.5 cm;
- text font: Times New Roman, font height - 14, space - 1.5;
- page numbering - from the bottom of the page. The number is not placed on the first page.



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The abstract should be completed competently with observance of the culture of presentation. There should be references to the literature used, including periodical literature for the last 5 years.

A *report* is a type of brief but informative communication about the essence of the issue under consideration, different opinions about the subject under study. In some cases, it is allowed to present the author's own point of view within the framework of thematic issues. Requirements for the design of the report:

The volume of the abstract should not exceed five printed pages.

A quality report has four main structural elements:

- 1) Introduction;
- 2) Introduction (at this stage the speaker should interest the audience, formulate the relevance and novelty of the research, emphasise the importance and purpose of the work done).
- 3) Main part (it tells about the research methods used, the work done, analyses the results obtained);
- 4) Conclusion (it summarises the results of the work).

The text part of the report is drawn up on a sheet of the following format:

- top indent - 2 cm; left indent - 3 cm; right indent - 1.5 cm; bottom indent - 2.5 cm;
- text font: Times New Roman, font height - 14, space - 1.5;
- page numbering - from the bottom of the page. No number should be placed on the first page.

*Crossword* - is a puzzle task; its essence is to fill the intersecting rows of cells (vertically and horizontally) with words solved by the given list of definitions of the meaning of these words (questions).

Requirements for the design of the crossword puzzle:

- Type of crossword puzzle - classical;
- is not allowed to have blank cells in the grid crossword puzzle;
- are not allowed random letter combinations and crossings;
- puzzled words must be nouns in the nominative case;
- two-letter words must have two crossings;
- abbreviations are not allowed;
- no abbreviations are allowed;
- all texts must be written legibly;
- each sheet must have the author's surname;
- the drawing of the crossword puzzle must be clear;
- grids of all crossword puzzles should be made in duplicate: with filled words and only with numbers of positions;
- answers to the crossword puzzle published separately, they are designed to check the



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correctness of the solution of the crossword puzzle.

*Abstract* - a type of extracurricular independent work of the student to create an overview of the information contained in the object of outlining, in a more concise form. The abstract should reflect the main principle provisions of the source, the new things that the author has introduced, the main methodological provisions of the work, arguments, stages of proof and conclusions. The value of the outline is greatly enhanced if the student presents his/her thoughts in his/her own words, in a concise form. The abstract should begin with the details of the source (author's surname, full name of the work, place and year of publication). Particularly significant places, examples are highlighted by colour underlining, framing, notes in the margins to draw attention to them and to remember them more firmly.

### **Guidelines for preparation for final examination.**

Final examination in the form of a credit for the discipline "Normal Physiology" is carried out based on the results of attendance, and current and end-of-term (modular) control.

In this regard, to successfully pass the final control is recommended to attend all classes actively participate in classroom lessons, and the completion of independent work of the student.

All modules are conducted according to the module schedule. The tests themselves have three sections: exam, module, and practice mode. The exam and module are available according to the schedule, the training mode is available on the electronic educational platform [www.test.edu.kg](http://www.test.edu.kg), where students can practice solving tests online.

Methodological materials are also available on the e-learning platform [www.test.edu.kg](http://www.test.edu.kg). Each student has his/her ID number and password to log in to this platform. The student has the opportunity to log in from a computer, tablet, and phone, select a discipline for each topic of the selected discipline, and perform a test task (MCQ).

### **Methodological recommendations on student's research work.**

The aim of the research work is to develop the intellectual abilities of students by means of studying the algorithm of scientific research and acquiring initial experience of research project implementation on the educational material of the chosen speciality.

The main objectives and results of research work are:

- acquiring scientific methods of cognition and deepening the theoretical knowledge of students in the speciality;
- mastering of modern methods of scientific research;
- development of students' practical skills of independent search of scientific and technical information, conducting theoretical and/or experimental work;
- gaining the students' ability to analyse the results of the conducted research, formulate conclusions and recommendations;





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- development of students' ability to independent, creative, active activity for continuous updating and enrichment of scientific baggage;
- identification of students with a pronounced motivation for scientific activity;
- development of analytical abilities and non-standard thinking.

When performing a research work should master the following basic steps:

- independent search for information on a given topic;
- selection of essential information necessary for complete coverage of the studied problem, separation of this information from secondary information (within the given topic);
- analysing and synthesising knowledge and research on the problem;
- summarising and classifying information on research problems;
- logical and consistent disclosure of the topic;
- summarising psychological knowledge on the problem and formulating conclusions from the literature review of the material;
- stylistically correct design of scientific thought of abstract type;
- competent design of scientific paper.

### References:

#### *Basic references*

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2. Fundamentals of Human physiology/ L Sherwood/ 4<sup>th</sup> edition, 2012
3. Medical physiology/ JD Kibble, CR Halsey – 2009
4. Principles of Human physiology/ CL Stanfield – 5<sup>th</sup> edition, 2013
5. Review of Medical Physiology/ William F. Ganong/ McGraw-Hill – 20<sup>th</sup> edition, 2001
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#### *Additional references*

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### **WEB references**

- [www.iprbookshop.ru](http://www.iprbookshop.ru).
- [www.medportal.ru](http://www.medportal.ru).

### **Course policy**

- Obligatory attendance at classes.





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- Compulsory presence of uniform (white medical gown and change of slippers, during laboratory classes, among other things, it is necessary to have a cap and non-sterile gloves).
- Active participation of the student in practical classes, preliminary preparation, and performance of homework.
- Qualitative and timely performance of tasks on SIW and SIWT.
- Participation in all types of control (current, midterm, final).

Additional requirements:

- Each missed class and/or leaving before the end of class for any reason counts as one missed class to be worked out,
- 2 points will be subtracted from the attendance score for each missed class, except for classes missed due to illness with a doctor's note from ISM IUK.
- The following will not be tolerated: the use of cell phones during classes, failure to submit assignments on time, failure to comply with the subordination and rules of conduct.

#### Assessment criteria

The control of students' knowledge is carried out according to the point-rating system in accordance with the standard "Regulations on the modular point-rating system for assessing the knowledge of students at the NEI ESPC "International University of Kyrgyzstan".

The discipline "Normal Physiology" includes 7 modules on 1-2 semesters, each module is evaluated by 100 points system:

Maximum score is 100, of which:

- attendance - 20 points;
- current control - 40 points (20 points - for auditory work, 20 points - for independent work),
- midterm control (module passing) - 40 points.

Scoring Policy	Module 1	Module 2
Classroom work (activity in discussions, oral questioning)	40 points	40 points
Independent work	20 points	20 points
Report, etc.	40 points	40 points
Total per module:	100 points	100 points

#### Oral survey assessment criteria:

- grade "excellent" is awarded to a student if he/she has given a logically structured, detailed, and correct answer to all the questions asked, with the demonstration of knowledge of the lecture material and additional literature, has given comprehensive answers to clarifying and additional questions;



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- a grade of "good" is awarded to a student who has given a fully correct answer to the seminar questions with observance of the logic of the presentation of the material, but has made some inaccuracies in his/her answer that are not fundamental, as well as to a student who has not answered the additional questions clearly and exhaustively enough;
- a grade of "satisfactory" is awarded to a student who has shown incomplete knowledge, made mistakes and inaccuracies in answering the seminar questions, demonstrated the inability to logically build the material of the answer, and formulate a clear answer to additional or clarifying questions;
- the grade "unsatisfactory" is given to a student if he/she has not given an answer to the given questions, has given incorrect answers to all questions, has given incorrect answers containing factual errors, has not been able to answer additional and clarifying questions or has refused to answer.

#### **PBL/TBL assessment criteria:**

- the "excellent" grade is given to the student if the answer to the problem question is given correctly. Explanation of the course of its decision is detailed, consistent, and competent, with theoretical justifications (including from a lecture course), with the necessary schematic image and demonstration, with correct and free knowledge of physiological terminology; the answers to additional questions are correct, clear;
- the "good" score is given to the student if the answer to the problem question is given correctly. An explanation of the course of its decision is detailed, but not logical enough, with isolated errors in details, some difficulties in theoretical justification (including from lecture material), with isolated errors in the use of physiological terms; the answers to additional questions are correct, but not clear enough;
- the "satisfactory" score is given to the student if the answer to the problem question is given correctly. The explanation of the course of its decision is not complete enough, inconsistent, with errors, weak theoretical justification (including lecture material), the answers to additional questions are not clear enough, with errors in detail;
- the "unsatisfactory" score is given to the student if the answer to the task question is incorrect. An explanation of the course of its decision is given incomplete, inconsistent, with gross errors, and without theoretical justification (including lecture material); The answers to additional questions are incorrect or missing.

#### **Laboratory work assessment criteria:**

- The grade "excellent" is given to the student if the laboratory work is performed with observance of safety rules; the protocol of laboratory work is executed during the class, it contains a detailed description of all stages of laboratory work. The correct detailed conclusion is given, confirmed by the signature of the teacher;



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- The grade "good" is given to the student if the laboratory work is performed in compliance with safety rules; the protocol of the laboratory work is executed during the class; and the stages of the laboratory work are not described in sufficient detail. The conclusion, confirmed by the signature of the teacher, contains minor errors;
- the grade "satisfactory" is given to the student if the laboratory work is performed with minor violations of safety rules; the protocol of the laboratory work is executed during the class, but it lacks a description of some stages of the laboratory work. The conclusion, confirmed by the signature of the teacher, contains no gross errors;
- the grade "unsatisfactory" is given to the student if the laboratory work is performed with serious violations of safety rules, the protocol of the laboratory work is not executed during the class or contains gross errors in the design and conclusion, as well as for failure to complete the laboratory work.

#### **MCQ testing assessment criteria:**

- A grade of "excellent" is given to a student if he/she has given a correct answer to all questions;
- A "good" grade is given to a student if he/she gives one wrong answer out of five or two wrong answers out of ten;
- a "satisfactory" grade is given to a student if no more than two incorrect answers out of five or four incorrect answers out of ten are given;
- an "unsatisfactory" grade is given to a student if he/she gives more than half of the wrong answers.

#### **Paper work assessment criteria:**

- A grade "excellent" is given to a student if the topic of the abstract is fully disclosed, excellent mastery of the material is demonstrated, appropriate sources are used in the right amount, the structure of the work corresponds to the set tasks, the degree of independence of the work is high;
- A grade of "good" is given to a student, if the topic of the essay is disclosed, good mastery of the material is demonstrated, appropriate sources are used, the structure of the work corresponds to the set tasks, the degree of independence of the work is average;
- A grade "satisfactory" is given to the student if the topic of the essay is poorly disclosed, satisfactory mastery of the material is demonstrated, the sources used and the structure of the work partially correspond to the tasks set, the degree of independence of the work is low;
- An "unsatisfactory" is given to a student if the topic of the abstract is not disclosed, unsatisfactory mastery of the material is demonstrated, the sources used are insufficient,





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the structure of the work does not correspond to the tasks set, and the work is not independent.

### **Report assessment criteria:**

- grade "excellent" is given to the student if the report has high relevance, the content of the report corresponds to the topic, the material is deeply elaborated, the sources are used competently and completely, the report is decorated in accordance with the requirements, when defending the report the student demonstrated excellent ability to lead a discussion and answer questions;
- a grade of "good" is given to a student if the report has high relevance, the content of the report corresponds to the topic, the material is sufficiently elaborated, the sources are used competently, minor errors are made in the design of the report, the student demonstrated a good ability to lead a discussion and answer questions when defending the report;
- the grade "satisfactory" is given to the student if the report is relevant, the content of the report corresponds to the topic, the material is sufficiently elaborated, the sources are used incompletely, minor mistakes are made in the design of the report, the student demonstrated insufficient skills in discussion and answering questions when defending the report;
- the grade "unsatisfactory" is given to the student if the report is not relevant, the content of the report does not correspond to the topic, the material is not sufficiently elaborated, the sources are used incompletely, gross errors are made in the design of the report, the student demonstrated insufficient skills in discussion and answering questions when defending the report.

### **Abstract assessment criteria:**

- the "excellent" score is given to the student if the completeness of the use of educational material, the logic of presentation (the presence of schemes, the number of semantic connections between concepts), clarity (the presence of drawings, symbols, etc.; accuracy of execution, readability of the summary, literacy (terminological and spelling));
- the "good" score is given to the student if the use of educational material is not complete, it is not sufficiently logical to present (the presence of schemes, the number of semantic connections between concepts), clarity (the presence of drawings, symbols, etc.; accuracy of execution, readability of the summary, literacy (terminological and spelling), lack of related sentences;
- the "satisfactory" score is given to the student if the use of educational material is not complete, it is not sufficiently logical to present (the presence of schemes, the number of semantic connections between concepts), clarity (the presence of drawings, symbols, etc.; accuracy of execution, readability of the summary, literacy (terminological and spelling), lack of independence during compilation can be traced;





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- the "unsatisfactory" score is given to the student if the use of educational material is not complete, there are no schemes, the number of semantic connections between concepts, there is no clarity (presence of drawings, symbols, etc.; accuracy of execution, readability of the summary, terminology and spelling errors, lack of independence in drafting were made.

### **Crossword assessment criteria:**

- grade "excellent" is given to the student if the crossword puzzle successfully fits into any figure or image, all words of the crossword puzzle corresponds to the topic, questions are formulated clearly, there are no spelling, grammatical and speech errors;
- grade "good" is assigned to the student if the crossword puzzle fits well enough in any figure or image, all the words of the crossword puzzle corresponds to the theme, questions are formulated clearly, there are spelling, grammatical and speech errors;
- grade "satisfactory" is assigned to the student if the crossword puzzle does not fit into any figure or image, not all the words of the crossword puzzle corresponds to the theme, questions are not formulated clearly enough, there are spelling, grammatical and speech errors;
- grade "unsatisfactory" is assigned to the student if the crossword puzzle is not completed or does not fit into any figure or image, most of the words of the crossword puzzle does not correspond to the topic, questions are not clearly formulated, there are spelling, grammatical and speech errors.

### **Assessment criteria for table completion:**

- grade "excellent" is assigned to a student if the table is filled in accurately, all cells contain correct information, is designed neatly and graphically, with high independence of work performance;
- a grade "good" is awarded to a student if the table is filled in completely, there are single errors in the table, it is neatly and graphically designed, with sufficient independence of work performance;
- a "satisfactory" grade is given to a student if the table is filled in inaccurately and incompletely, there are errors in the table, it is designed sloppily, the degree of independence of work performance is low;
- "unsatisfactory" grade is given to a student if the table is not filled in if the table is filled in inaccurately, if there are gross errors in the table if the table is inaccurately designed, if the degree of independence of work performance is low.



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### Presentation assessment criteria:

- grade "excellent" is assigned to the student if the presentation corresponds to the topic of the independent work, the title slide with the title (topic, goals, plan, etc.) is designed; the formulated topic is clearly stated and structured; graphic images (photos, pictures, etc.) corresponding to the topic are used, the style, color scheme is maintained, animation, sound is used, the work is designed and submitted in due time;

- grade "good" is given to the student if the presentation corresponds to the topic of the independent work, the title slide with the title (topic, objectives, plan, etc.) is designed, the formulated topic is clearly stated and structured, graphic images (photos, pictures, etc.) corresponding to the topic are used, the work is designed and submitted in due time;

- grade "satisfactory" is given to the student if the presentation does not fully correspond to the topic of the independent work, the title slide with the title (topic, objectives, plan, etc.) is designed, the formulated topic is not sufficiently outlined and structured, graphic images (photos, pictures, etc.) corresponding to the topic are not used, the work is designed and submitted in due time;

- grade "unsatisfactory" is given to the student if the presentation does not correspond to the topic of the independent work, the title slide with the title (topic, objectives, plan, etc.) is not designed, the formulated topic is not sufficiently outlined and structured, graphic images (photos, pictures, etc.) corresponding to the topic are not used, the work is not designed or submitted in due time.

### Final control in the form of credit is held at the end of the semester, and based on the results of mid-term control.

Form of final control in 1<sup>st</sup> semester – credit.

The following grading scale is used for students' knowledge assessment:

Scale of correspondence of grades and points				
Maximum score	Intervals			
	«unsatisfactory»	«satisfactory»	«good»	«excellent»
20	0-11	12-15	16-17	18-20
40	0-23	24-30	31-35	36-40
60	0-35	36-45	46-53	54-60
100	0-59	60-75	76-89	90-100

**Help:** for consultations on the completion of independent works (SIW/SIWT), their submission and defence, as well as for additional information on the material covered and all other arising questions on the course, please contact the teacher MON, WED (08:00-16:00).