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**Federal State Autonomous Educational Institution for Higher Education  
PEOPLES' FRIENDSHIP UNIVERSITY OF RUSSIA  
RUDN University**

**Institute of Medicine**

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educational division (faculty/institute/academy) as higher education programme developer

## **COURSE SYLLABUS**

### **NORMAL PHYSIOLOGY - PHYSIOLOGY OF THE MAXILLOFACIAL AREA**

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course title

**Recommended by the Didactic Council for the Education Field of:**

**05.31.03 Dentistry**

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*(higher education field)*

**The course instruction is implemented within the professional education program  
of higher education:**

**Dentistry**

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*(name (profile/specialization) EP HE)*

### 1. COURSE GOAL(s)

The goal of the course "Normal physiology - physiology of the maxillofacial area" is to equip students with the knowledge about the development of structures and functions of various body systems based on modern achievements of physiological science, necessary for the formation of a natural scientific worldview and practical activities of a dentist.

### 2. REQUIREMENTS FOR LEARNING OUTCOMES

Mastering the course (module) "Normal physiology - physiology of the maxillofacial area" is aimed at the development of the following competences /competences in part...

Mastering the course " Normal physiology - physiology of the maxillofacial area" is aimed at developing the following competencies among students: GPC-9.

*Table 2.1. List of competences that students acquire through the course study*

Competence code	Competence descriptor	Competence formation indicators (within this course)
Competence code	Competence descriptor	Competence formation indicators (within this course)
GPC -9.	Able to appreciate the morphological and functional states and pathological processes in the human body to solve professional problems	GPC-9.1. Being able to use the algorithm of clinical, laboratory and functional diagnosis in dealing with professional tasks.
		GPC-9.2. Evaluating the results of clinical, laboratory and functional diagnosis in dealing with professional tasks.
		GPC-9.3. Determining morpho-functional, physiological states and pathological processes of the human body.

### 3. COURSE IN HIGHER EDUCATION PROGRAMME STRUCTURE

The course refers to the core/variable/elective\* component of (B1) block of the higher educational programme curriculum.

\* - Underline whatever applicable.

Within the higher education programme students also master other (modules) and / or internships that contribute to the achievement of the expected learning outcomes as results of the course study.

Table 3.1. The list of the higher education programme components/disciplines that contribute to the achievement of the expected learning outcomes as the course study results

Competence descriptor	Previous courses/modules*	Subsequent courses/modules*
GPC -9.	Human Anatomy - Head and Neck Anatomy	Pathological anatomy, pathological anatomy of the head and neck Pathophysiology - Pathophysiology of the Head and Neck Forensic Medicine Topographic anatomy and operative surgery of the head and neck

\* To be filled in according to the competence matrix of the higher education programme.

#### 4. COURSE WORKLOAD AND ACADEMIC ACTIVITIES

The total workload of the course is \_\_\_\_ credits (\_\_\_\_\_ academic hours).

Type of academic activities	Total academic hours	Semesters/training modules			
		2	3		
<i>Contact academic hours</i>	<b>122</b>	<b>54</b>	<b>68</b>		
including:					
Lectures (LC)	35	18	17		
Lab work (LW)	87	36	51		
Seminars (workshops/tutorials) (S)					
<i>Self-studies</i>	<b>31</b>	<b>18</b>	<b>13</b>		
<i>Evaluation and assessment (exam/passing/failing grade)</i>	<b>27</b>	<b>27</b>	<b>27</b>		
<b>Course workload</b>	academic hours	<b>180</b>	<b>72</b>	<b>108</b>	
	credits	<b>5</b>	<b>2</b>	<b>3</b>	

#### 5. COURSE CONTENTS

Table 5.1. Course contents and academic activities types

Type of academic activities	Total academic hours	Semesters/training modules
Module 1. Physiology of excitable tissues.	Theme 1.1. General physiology and cell physiology. Cell membranes, transport of substances through the cell membrane. Analysis and solution of problems related to the Theme of classes.	L, LW

	Theme 1.2. Excitability and its parameters. Membrane potential. Action potential. Analysis and solution of problems related to the Theme of classes.	L, LW
	Theme 1.3. Synapse physiology. Physiology of the nerve fiber, nerve. Analysis and solution of problems related to the Theme of classes.	L, LW
	Theme 1.4. Physiology of muscle contraction. "Dynamometry. Research of maximum voluntary strength and strength endurance of muscles". "The effect of various types of rest on the effectiveness of restoring muscle performance". Analysis and solution of problems related to the Theme of classes.	L, LW
Module 2. Physiology of the central nervous system. Physiology of higher nervous activity.	Theme 2.1. Nervous regulation of physiological functions. Reflex and its characteristics. Inhibition in the central nervous system. Basic properties of nerve centers. Private physiology of the central nervous system. "Research of human unconditioned reflexes". "Investigation of cerebellar control of skeletal muscle motor activity".	L, LW
	Theme 2.2. Physiology of the autonomic nervous system. Sympathetic, parasympathetic, and metasympathetic nervous systems. The role of the autonomic nervous system in the development of adaptive responses. "Approximate assessment of human vegetative tone by questionnaire". "Assessment of vegetative tone by the Kerdo index".	L, LW
	Theme 2.3. Physiology of higher nervous activity. A conditioned reflex. Dynamic stereotype. "Determination of psychological characteristics of a person using the EPI personality questionnaire (G. Eysenck's method)".	L, LW
	Theme 2.4. Memory. Sleep. "Study of attention switching" "The dependence of memory size on the degree of meaningfulness of the material". "Electroencephalography". Analysis and solution of problems related to the theme of classes.	LW
Module 3. Physiology of sensory systems.	Theme 3.1. General physiology of analyzers. Skin analyzer. "Study of tactile sensitivity (esthesiometry)".	L, LW

	Theme 3.2. Physiology of vision. "Determination of visual acuity", "Determination of the visual field (perimetry)"	L, LW
	Theme 3.3. Physiology of hearing and vestibular apparatus. "Comparison of air and bone conduction (Rinne test)".	L, LW
	Theme 3.4. Physiology of taste and smell. "Determination of taste sensitivity thresholds". "Determining the role of the sense of smell in the occurrence of taste sensations"	L, LW
Module 4. Blood physiology.	Theme 4.1. Function and composition of blood. Shaped blood elements. Blood types. Blood buffer systems. "Determination of blood type and Rh factor".	LW
	Theme 4.2. A system for regulating the aggregate state of blood. "Determining the bleeding time". "Determining the folding time".	L
Module 5. Physiology of digestion.	Theme 5.1. Functions of the digestive tract. Motor functions of the digestive tract. Secretory function and digestion in the oral cavity. "Digestion of starch by human saliva enzymes", "Determination of the active saliva reaction (pH) using universal indicator paper".	L, LW
	Theme 5.2. Secretory function and digestion in the stomach, small and large intestines. The role of the liver in digestion. Absorption of nutrients in the gastrointestinal tract. "Investigation of the enzymatic properties of gastric juice". "The effect of bile on fats".	L, LW
Module 6. Excretion, kidney physiology.	Theme 6.1. The system of excretory organs. Formation of urine in the kidneys. Kidneys as an organ of homeostasis. "Study of some components of urine using diagnostic strips".	L, LW
	Theme 6.2. Non-urinary functions of the kidneys. The role of the kidneys in the development of adaptive responses of the body. Bladder and urination. Methods of studying kidney function. Solving problems related to the Theme of the lesson. Analysis of the renin-angiotensin-aldosterone system scheme.	LW

Module 7. Physiology of the cardiovascular system.	Theme 7.1. Physiology of the cardiovascular system. Heart cycle. Spread of arousal in the heart. Conducting system of the heart. Properties of the heart muscle. Nervous and humoral regulation of the heart. "Registration of an electrocardiogram. Interpretation of a normal electrocardiogram".	L, LW
	Theme 7.2. Vascular physiology. Basic laws of hemodynamics. Microcirculation and lymph flow. Methods of blood circulation research. "Assessment of the parameters of the cardiovascular system at rest and during physical exertion".	L, LW
Module 8. Physiology of respiration.	Theme 8.1. Physiology of respiration. External breathing. Lung volumes and capacities. "Spirometry".	L, LW
	Theme 8.2. Regulation of respiration. Transfer of gases by blood. "Conducting hypoxemic tests of Stange and Gencha".	L, LW
Module 9. Physiology of the endocrine glands.	Theme 9.1. Endocrine regulation of physiological functions. General properties of hormones, hierarchy in the activity of the endocrine glands Private physiology of the endocrine glands.	L
	Theme 9.2. Humoral regulation of physiological functions. Physiology of the endocrine glands. "Determination of the concentration of glucose in human blood", "Construction of a glycemic curve during the glucose tolerance test".	LW
Module 10. Metabolism and energy. Thermoregulation.	Theme 10.1. Human metabolism. Energy exchange. Determination of the metabolic rate. Basic exchange, daily energy consumption. Exchange of protein, fat, and carbohydrates. "Calculation of basal metabolic rate and daily energy consumption".	L, LW
	Theme 10.2. Regulation of metabolism. Physiological basis of nutrition. Basic principles of compiling food rations. "Assessment of the state of human metabolism based on the analysis of body weight (calculations of body mass index and ideal body mass)". "Estimation of the distribution of human body fat by the waist/hip index". "Estimation of human body fat mass by caliperometry". "Compilation and evaluation of food rations".	LW

	Theme 10.3. Thermoregulation and thermoreception. "Study of temperature sensitivity (thermoesthesiometry)".	L, LW
Module 11. Physiology of the maxillofacial region.	Theme 11.1. Composition and properties of saliva. Physiological significance of oral and gingival fluid. Structure and functions of maxillofacial organs.	L
	Theme 11.2. Sensory system of the maxillofacial region.	L
Module 12. Coordination and integration of physiological functions.	Theme 12.1. Coordination and integration of the physiological functions.	L

\* - to be filled in only for **full** -time training: *LC* - lectures; *LW* - lab work; *S* - seminars.

## 6. CLASSROOM EQUIPMENT AND TECHNOLOGY SUPPORT REQUIREMENTS

*Table 6.1. Classroom equipment and technology support requirements*

Type of academic activities	Classroom equipment	Specialised educational / laboratory equipment, software, and materials for course study (if necessary)
Lecturers	Classroom, equipped with a set of specialized furniture; whiteboard; a set of devices includes portable multimedia projector, laptop, projection screen, stable wireless Internet connection.	Classroom for lectures and lab works, group and individual consultations, current control and intermediate certification.  A set of specialized furniture; technical devices: multimedia projectors Optoma or View Sonic, nettop Lenovo, wall projection motoscreens Digis.
Lab work	Classroom, equipped with a set of specialized furniture; whiteboard; a set of devices includes portable multimedia projector, laptop, projection screen, stable wireless Internet connection.	Classroom for lectures and lab works, group and individual consultations, current control and intermediate certification.  A set of specialized furniture; technical devices: multimedia projectors Optoma or View Sonic, nettops Lenovo, wall projection motoscreens Digis, complexes for laboratory work (BIOZHEZL), universal stand, a set of tables, universal indicator paper (pH), test strips for

Type of academic activities	Classroom equipment	Specialised educational / laboratory equipment, software, and materials for course study (if necessary)
		<p>determining urine components, neurological hammer, set of tuning forks, carpal dynamometer, multimedia installation, Colyclons Anti-A Anti-B and anti-AB for determining blood groups according to the ABO system, colyclons Anti-D for determining the Rh factor according to the Cde system, electrocardiographs EK1T-O7 and Axion, sphygmomanometer, phonendoscope, air spirometer, stopwatch, Forster perimeter, Sivtsev tables, portable glucometer, electroencephalograph.</p> <p>Audiovisual teaching aids: educational films.</p> <p>Educational computer programs used in practical classes: program for testing "Mytest".</p>
Self-studies	Classroom, equipped with a set of specialized furniture; whiteboard; a set of devices includes portable multimedia projector, laptop, projection screen.	<p>Classroom for lectures and lab works, group and individual consultations, current control and intermediate certification.</p> <p>A set of specialized furniture; technical devices: multimedia projectors Optoma or View Sonic, nettops Lenovo, wall projection motoscreens Digis, audiovisual teaching aids: educational films, educational computer programs used in practical classes: program for testing "Mytest".</p>

\* The premises for students' self-studies are subject to **MANDATORY** mention

## 7. RESOURCES RECOMMENDED FOR COURSE STUDY

### *Main readings:*

1. Fundamentals of human physiology : textbook. In 2 volumes. T. 1 / N.A. Aghajanyan, I. G. Vlasova, N.V. Ermakova [and others]; Ed. IN AND. Torshina. - 5 th ed. Rev . and add. ; Electronic text data. - M.: Publishing house of RUDN University, 2017 .-- 524 p. : ill. - ISBN 978-5-209-06817-4. - ISBN 978-5-209-06816-7: 138.36. [http://lib.rudn.ru/MegaPro/UserEntry?Action=Rudn\\_FindDoc&id=460159&idb=0](http://lib.rudn.ru/MegaPro/UserEntry?Action=Rudn_FindDoc&id=460159&idb=0),



2. Fundamentals of human physiology : textbook. In 2 volumes. Vol. 2 / N.A. Aghajanyan, I. G. Vlasova, N.V. Ermakova [and others]; Ed. IN AND. Torshina. - 5 th ed. Rev . and add. ; Electronic text data. - M.: Publishing house of RUDN, 2017 .-- 456 p. : ill. - ISBN 978-5-209-06817-4. - ISBN 978-5-209-07434-2: 138.36. [http://lib.rudn.ru/MegaPro/UserEntry?Action=Rudn\\_FindDoc&id=460012&idb=0](http://lib.rudn.ru/MegaPro/UserEntry?Action=Rudn_FindDoc&id=460012&idb=0)

#### *Optional readings*

1. Collection of control tasks in physiology for testing and independent work of a student: a textbook for practical exercises and independent work of students / V.I. Torshin, N.V. Ermakova, Z. V. Bakaeva, O. V. Mankaev ; Under total. ed. V.I. Torshina , N.V. Ermakova . - Electronic text data. - M.: Publishing house of RUDN University, 2017 .-- 533 p. - ISBN 978-5-209-08013-8 : 450.00. [http://lib.rudn.ru/MegaPro/UserEntry?Action=Rudn\\_FindDoc&id=461714&idb=0](http://lib.rudn.ru/MegaPro/UserEntry?Action=Rudn_FindDoc&id=461714&idb=0)
2. Brin V.B. Human physiology in diagrams and tables: textbook / V.B. Brin. - SPb . : Publishing house "Lan", 2017. - 608 p. - (Textbooks for universities. Special literature). - ISBN 978-5-8114-2054-4 [http://lib.rudn.ru/MegaPro/UserEntry?Action=Rudn\\_FindDoc&id=465025&idb=0](http://lib.rudn.ru/MegaPro/UserEntry?Action=Rudn_FindDoc&id=465025&idb=0)

#### *Internet sources*

##### **Electronic libraries with access for RUDN students:**

1. Electronic libraries with access for RUDN students – ELN PFUR: <http://lib.rudn.ru:8080/MegaPro/Web>
2. Online University library: <http://www.biblioclub.ru>
3. IQlib: <http://www.iqlib.ru>
4. NEL Elibrary: <http://elibrary.ru>
5. Science Direct: <http://www.sciencedirect.com>
6. EBSCO: <http://search.ebscohost.com>
7. Oxford University Press: <http://www3.oup.co.uk/jnls>
8. Sage Publications: <http://online.sagepub.com>
9. Springer/Kluwer: <http://www.springerlink.com>
10. Tailor & Francis: <http://www.informaworld.com>
11. Web of Science: <http://www.isiknowledge.com>
12. Student advisor: <http://www.studmedlib.ru>
13. University information system Russia: <http://www.cir.ru/index.jsp>
14. Learning portal of the PRUR: <http://web-local.rudn.ru/>

##### **Data bases**

1. U.S. National Library of Medicine National Institutes of Health: <http://www.ncbi.nlm.nih.gov/pubmed/>
2. ACS Publications: Data base / American Chemical Society. – Database on English. - Washington : ACS Publications, 2013. - Access mode:: <http://pubs.acs.org/>
3. RSC Journals : Data base / Royal Society of Chemistry. - Database on English. - London : RSC Publishing, 2013. - Access mode:: <http://pubs.rsc.org/>
4. Springer Link: Data base / Springer Science+Business Media. - Database on English. - Berlin : Springer Science+Business Media, 2013. – Access mode: <http://link.springer.com/>.

*Training toolkit for self- studies to master the course* \*:

1. The set of lectures on the course "Normal physiology - physiology of the maxillofacial area".

2. The laboratory workshop (if any).on the course"Normal physiology - physiology of the maxillofacial area".

3. The guidelines for writing a course paper / project (if any) on the course "Normal physiology - physiology of the maxillofacial area".

4. ....

\* The training toolkit for self- studies to master the course is placed on the course page in the university telecommunication training and information system under the set procedure.

## **8. ASSESSMENT TOOLKIT AND GRADING SYSTEM\* FOR EVALUATION OF STUDENTS' COMPETENCES LEVEL UPON COURSE COMPLETION**

The assessment toolkit and the grading system\* to evaluate the competences formation level (GPC -9) upon the course study completion are specified in the Appendix to the course syllabus.

\* The assessment toolkit and the grading system are formed on the basis of the requirements of the relevant local normative act of RUDN University (regulations / order).

### **DEVELOPERS:**

Professor Department of Normal physiology	of	D.S. Sveshnikov
_____	_____	_____
position, department	signature	name and surname
Assoc. prof. Department of Normal physiology	of	E.B. Yakunina
_____	_____	_____
position, department	signature	name and surname

### **HEAD OF EDUCATIONAL DEPARTMENT:**

of Department of Normal physiology		V.I. Torshin
_____	_____	_____
name of department	signature	name and surname

**HEAD**

**OF HIGHER EDUCATION PROGRAMME:**

**First Deputy Director of Medical**

**Institute for academic affairs**

S.N. Razumova

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position, department

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signature

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name and surname