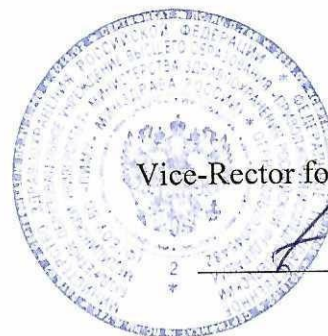


Federal State Budgetary Educational Institution of Higher Education
"Privolzhsky Research Medical University"
Ministry of Health of the Russian Federation



APPROVED

Vice-Rector for Academic Affairs

E.S. Bogomolova

31 August 2021

WORKING PROGRAM

Name of the academic discipline: **METHODS OF PHYSIOLOGICAL FUNCTIONS STUDY**

Specialty: **31.05.01 GENERAL MEDICINE**

(code, name)

Qualification: **GENERAL PRACTITIONER**

Department: **DEPARTMENT OF NORMAL PHYSIOLOGY NAMED AFTER N.YU. BELENKOV**

Mode of study: **FULL-TIME**

Labor intensity of the academic discipline: **72 academic hours**

Nizhny Novgorod

2021


The working program has been developed in accordance with the Federal State Educational Standard of Higher Education in the qualification 31.05.01 «General medicine», approved by the order of the Ministry of Science and Higher Education of the Russian Federation № 988 dated August 12, 2020 r.

Developers of the working program:

Mukhina I.V., PhD, DrSci, Professor, Head of the Normal Physiology Department named after N.Yu. Belenkov


Volkova I.F., PhD, Associate Professor, Associate Professor of the Normal Physiology Department named after N.Yu. Belenkov

The work program was reviewed and approved at the Normal Physiology Department meeting, August, 29th, 2021 (protocol No. 1)

Head of the Normal Physiology Department
named after N.Yu. Belenkov, PhD, DrSci, Prof.  Mukhina I.V.
(signature)

August, 29th, 2021

AGREED

Deputy Head of EMA ph.d. of biology  Lovtsova L.V.
(signature)

August, 29th, 2021

1. The purpose and objectives of mastering the discipline "Methods of physiological functions study"

1.1. The purpose of mastering the discipline: participation in the formation of PC-5 competence.

1.2. Objectives of the discipline:

As a result of mastering the discipline the student has to:

- **Know:**
 - Physiological processes occurring in the human body and their manifestations.
 - Methods of research of sensory systems, electroencephalography – EEG, methods of research of higher nervous activity (HNA), hematological studies).
 - Principles of analysis and evaluation of the results of functional and laboratory diagnostic methods.
- **Be able to:**
 - Analyze and evaluate the results of laboratory and functional diagnostic methods (EMG, nerve excitation rate study, reflex activity study, ECG, PCG, photoplethysmography, pneumotachometry, spirometry, sensory system research methods, EEG, HNA research methods, thermometry, hematological studies).
 - To analyze and evaluate the functional state of various cellular, tissue and organ structures;
- **Possess:**
 - Skills of independent use of the physiological conceptual apparatus.

2. Position of the academic discipline in the structure of the General Educational Program of Higher Education (GEP HE) of the organization.

2.1 The discipline "Methods of physiological functions study" (B1.O.3) refers to the core part of Block 1 (B.1.O) of the "Disciplines" of the general educational program of higher education. The discipline is studied in the third and fourth semesters.

2.2. The following knowledge, skills and abilities formed by previous academic disciplines are required for mastering the discipline:

- Latin language
- history of medicine
- psychology and pedagogy
- physics, mathematics
- biology
- chemistry
- biochemistry
- anatomy
- histology, embryology, cytology
- normal physiology

2.3. Mastering the discipline is required for forming the following knowledge, skills and abilities for subsequent academic disciplines:

- pathophysiology
- clinical pathophysiology
- propaedeutics of internal diseases
- pediatrics
- general surgery
- neurology, medical genetics, neurosurgery
- psychiatry
- medical psychology
- otorhinolaryngology

- ophthalmology
- anesthesiology, intensive care

3. Deliverables of mastering the academic discipline and metrics of competence acquisition

Mastering the discipline aims at acquiring the following professional (PC) competencies:

No.	The competence code	The content of the competence (or part of it)	Code and name of the competence acquisition metric	As a result of studying the discipline, students should:		
				Know	Be able to	Possess
2	PC-5	PC-5 Be able to collect complaints, anamnesis of the patient's life and illness, conduct a complete physical examination of the patient (examination, palpation, percussion, auscultation), formulate a preliminary diagnosis and make a plan for laboratory and instrumental examinations of the patient	PC-5.1 He knows: The legislation of the Russian Federation in the field of health protection, regulatory legal acts and other documents defining the activities of medical organizations and medical workers; methods of collecting complaints, anamnesis of the patient's life and illness; methods of complete physical examination of the patient (examination, palpation, percussion, auscultation); etiology, pathogenesis and pathomorphology, clinical picture, differential diagnostics, features of the course, complications and outcomes of diseases of internal organs; regularities of functioning of a healthy human body and mechanisms of ensuring health from the standpoint of the theory of functional systems; features of regulation of functional systems of the human body in pathological processes; methods of laboratory and instrumental studies to assess the state of health, medical indications for research, rules for interpreting their results.	Physiological processes occurring in the human body and their manifestations; Methods of functional and laboratory diagnostics (EMG, study of the rate of excitation along the nerve, study of reflex activity, ECG, PCG, photoplethysmography, pneumotachometry, spirometry, methods of studying sensory systems, EEG, methods of studying HNA, thermometry, hematological studies).	Evaluate the results of laboratory and functional diagnostic methods; Perform practical work under the guidance of a teacher; Evaluate the physiological states of various cellular, tissue and organ structures.	Skills of independent use of the physiological conceptual apparatus.

4. Sections of the discipline and competencies that are formed when mastering them:

No.	Competence code	Section name of the discipline	The content of the section in didactic units
1.	PC-5	Methods of investigation of the functional state of excitable systems	Criteria for assessing excitability: threshold strength, time, gradient of the increase in the strength of the stimulus over time. The " strength-duration" curve. Chronaximetry. Investigation of the rate of excitation in the nerve in humans, clinical significance. Electromyography (EMG): registration of a human electromyogram, analysis, clinical significance of the method.
2.	PC-5	Methods of studying the functions of the	The concept of modern methods of studying the functions of the central nervous system: magnetoencephalography, functional MRI, positron emission tomography, polysomnography, the method of evoked

		CNS	potentials). The study of reflexes in humans. Methods of studying the state of vegetative tone according to the parameters of the cardiovascular system. Methods of muscle tone research. The study of static coordination.
3.	PC-5	Methods of research of sensory systems.	Investigation of the general functions of sensory systems: adaptation, signal discrimination. Methods of investigation of air and bone conduction of sound in an auditory analyzer: Weber and Rinne samples, audiometry. The study of visual fields. Clinical significance of the methods.
4.	PC-5	Methods of HNA research	Electroencephalography (EEG): EEG registration, analysis, clinical significance. Determination of the speed and accuracy of information understanding by a correction test method.
5.	PC-5	Methods for the study of visceral functions	Methods of studying the activity of the cardiovascular system. Study of sound manifestations of heart activity (auscultation of heart tones, phonocardiography). The origin of heart tones, their types and places of the best listening. Investigation of mechanical manifestations of heart activity (palpation of cardiac impulse, echocardiography). Study of electrical manifestations of heart activity (electrocardiography, vectorcardiography). Structural analysis of a normal ECG in the II standard lead. Methods of investigation of arterial (palpation, sphygmography, resistography, plethysmography) and venous (phlebography) pulse. Clinical assessment of human pulse. Recording of ECG, PCG, photoplethysmograms (polygraphy). Methods of blood pressure research, their clinical significance. Methods for assessing the respiratory function of the lungs of gas exchange and transport of gases by blood. Pneumotachometry, spirometry, pulse oximetry. Methods for the study of blood parameters and hemostasis. Determination of erythrocyte sedimentation rate (ESR), observation of various types of hemolysis, coagulography, clinical significance of methods. Methods for determining the surface and deep body temperature. Thermometry. Infrared thermography.

5. Volume of the academic discipline and types of academic work

Type of educational work	Labor intensity		Labor intensity by semester (AH)	
	volume in credit units (CU)	volume in academic hours (AH)	3	4
Classroom work, including	1,2	44	22	22
Lectures (L)	0,3	10	8	2
Laboratory practicum (LP)				
Practicals (P)	0,9	34	14	20
Clinical practice (CP)				
Seminars (S)				
Student's individual work (SIW)	0,8	28	14	14
Mid-term assessment				
exam	2	72	36	36
TOTAL LABOR INTENSITY				

6. The content of the discipline

6.1. Sections of the discipline and types of classes:

No.	Semester number	Name of the section of the academic discipline	Types of lessons (in AH)*						
			L	LP	P	CP	S	SIW	total
1.	3	Methods of investigation of the functional state of excitable systems	3		4			3	10
2.	3	Methods of studying the functions of the CNS	3		2			3	8
3.	3	Methods of research of sensory systems.	1		4			4	9
4.	3	Methods of HNA research	1		4			4	9
5.	4	Methods for the study of visceral functions	2		20			14	36
6.		Total	10		34			28	72

* - L – lectures; LP – laboratory practicum; P – practicals; S – seminars; SIW – student's individual work.

6.2. Thematic schedule of educational work types:

6.2.1. Thematic plan of lectures*:

No.	Name of lecture topics	Volume in academic hours (AH)	
		Semester 3	Semester 4
1.	<i>Methods of investigation of excitable systems.</i> Criteria for assessing excitability: threshold strength, time, gradient of the increase in the strength of the stimulus over time. The " strength-duration " curve. Chronaximetry.	1	
2.	Physiology of skeletal muscles and nerves. Methods of studying the functional state of muscles and nerves.	2	
3.	Methods of CNS research. An idea of modern methods of brain research: magnetoencephalography, functional MRI, positron emission tomography, polysomnography, evoked potentials method). The study of reflexes in humans.	1	
4.	<i>Methods of muscle tone research.</i> The study of tonic reflexes and static coordination.	1	
5.	Methods of studying the state of vegetative tone according to the parameters of the cardiovascular system.	1	
6.	Methods of studying the functions of sensory systems: adaptation, signal recognizes.	1	
7.	Methods of HNA research Electroencephalography (EEG): EEG registration, analysis, clinical significance.	1	
8.	Methods of blood pressure research.		1
9.	Methods of studying the state of vegetative tone according to the parameters of the cardiovascular system.		1
	Total – 10 AH	8	2

*(Full-time form of education)

6.2.2. Thematic plan of laboratory practicum: not provided by GEF.

6.2.3. Thematic plan of practicals*:

No.	Topics of practicals	Volume in academic hours (AH)	
		Semester 3	Semester 4
1	Methods of investigation of excitable systems. <i>Criteria for assessing excitability. The " strength-duration " curve. Chronaximetry.</i> Practical work: 1. Establishing the relationship between the strength and duration of the stimulus	1	
2	<i>Methods of studying the functional state of nerves and muscles.</i> Practical work: 1. Registration of an electromyogram. 2. Determination of the rate of excitation along the ulnar nerve.	3	
3	Methods of studying the activity of the CNS Practical work: 1. The study of reflexes in humans.	1	
4	<i>Methods of muscle tone research</i> Practical work: 1. Static coordination study (Romberg test)	1	
5	Methods of research of sensory systems. Practical work: 1. Determination of spatial thresholds of tactile sensitivity (esthesiometry).	1	
6	<i>Research methods of the auditory analyzer.</i> Practical work: 1. Rinne's experience. 2. Weber's experience.	1	
7	<i>Methods of visual analyzer research.</i> Practical work: 1. The study of visual fields.	2	
8	Methods of HNA research. Practical work: 1. Determination of the speed and accuracy of information understanding by a correction test method.	2	
9	<i>Electroencephalography (EEG).</i> Practical work: 1. Registration of brain bio-currents and analysis of human electroencephalogram.	2	
10	Methods for the study of visceral functions <i>Methods of research of cardiac activity. ECG.</i> Practical work: 1. Registration and analysis of an electrocardiogram (ECG).		3
11	<i>Methods of research of the cardiovascular system.</i> Practical work: 1. Recording of ECG, PCG, plethysmograms (polygraphy).		3
12	<i>Methods of research of the cardiovascular system.</i>		1

	Practical work: 1. Assessment of the state of vegetative tone.		
13	<i>Methods of external respiration research.</i> Practical work: 1. Pneumotachometry. 2. Pulse oximetry.		2
14	<i>Regulation of external respiration.</i> Practical work: 1. Investigation of the influence of various conditions on pulmonary ventilation.		4
15	<i>Methods for the study of blood parameters.</i> Practical work: 1. Determination of the erythrocyte sedimentation rate by the Panchenkov method. 2. Observation of various types of hemolysis.		3
16	<i>Methods of hemostasis research.</i> Practical work: 1. Coagulography.		2
17	<i>Methods of thermoregulation research</i> Practical work: 1. Thermometry. Test		2
	Total	14	20
	Total	34	

*(Full-time form of education)

6.2.4. Thematic plan of seminars: not provided by the Federal State Educational Standard.

6.2.5. Types and topics of student's individual work (SIW)

No.	Types and topics of SIW	Value in academic hours (AH)	
		Semester 3	Semester 4
1.	Preparation for practical classes, homework, preparation for the control.	6	8
2.	Working with lecture material, taking notes	6	2
3.	Working with electronic resources on the distance education portal of the University.	2	4
	Total	14	14

6.2.6. Student research work

No.	The name of the topics of the student's research work	Semester
1.	Psychophysiological criteria and dynamics of mastering the technique of autogenic training.	3,4
2.	Methods of measuring body temperature.	3,4
3.	Dirichlet distribution in the task of assessing the state of the regulatory	3,4

	systems of the human body.	
4.	Application of the magnetic resonance imaging method in determining the volume of the perifocal zone of focal brain damage in ischemic stroke.	3,4

7. Types of assessment formats for ongoing monitoring and mid-term assessment

No.	№ semester	Forms of control	Name of the discipline section	Evaluation tools		
				Kinds	Number of questions in the task	Number of task options
1	2	3	4	5	6	7
1	3	Monitoring of mastering the topic	Methods of investigation of the functional state of excitable systems	Filling in tables	1	1
				Control questions	2	5
				A written report on the implementation of practical work.	According to the practical training plan (item 6.4)	1
				Situational tasks	1-3	2
2	3	Monitoring of mastering the topic	Methods of studying the functions of the CNS	Control questions	2	5
				Situational tasks	1	3
				A written report on the implementation of practical work.	According to the practical training plan (item 6.4)	1
3	3	Monitoring of mastering the topic	Methods of research of sensory systems.	Control questions	2	7
				Situational tasks	1-2	3
				A written report on the implementation of practical work.	According to the practical training plan (item 6.4)	1
4	3	Monitoring of mastering the topic	Methods of HNA research	Control questions	2	6
				Situational tasks	3	2
				A written report on the implementation of practical work.	According to the practical training plan (item 6.4)	1
5	4	Monitoring of mastering the topic	Methods for the study of visceral functions	Control questions	2	8
				Situational tasks	1-3	4
				A written report on the implementation of practical work.	According to the practical training plan (item 6.4)	1

6	Intermediate certification (exam)	4	All chapters	Interview	50	Computer testing (the variant is formed by random sampling)
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8. Educational, methodological and information support for mastering the academic discipline (printed, electronic publications, the Internet and other network resources)

8.1. Key literature references

No.	Name according to bibliographic requirements	Number of copies	
		At the department	In the library
1	Costanzo, Linda S. Physiology / L.S. Costanzo; Costanzo, Linda S. - 6th ed. - Philadelphia: Elsevier, 2018. - 516 p	1	180
2	Hall, John E. Textbook of medical physiology / J.E. Hall, A.C. Guyton; Hall, John E. ; Guyton, Arthur C. - 13th ed. - Philadelphia : Elsevier, 2016. - 1145 p.	2	100
3	Физиология с основами анатомии: учебник / под ред. А. И. Тюкавина, В. А. Черешнева, В. Н. Яковлева, И. В. Гайворонского. - М. : ИНФРА-М, 2020. - 574 с. 1 45	1	45

8.2. Further reading

No.	Name according to bibliographic requirements	Number of copies	
		At the department	In the library
1.	Гайворонский, И. В. Анатомия и физиология человека: учебник / И. В. Гайворонский; Гайворонский И. В. - Москва: ГЭОТАР-Медиа, 2019. - 672 с. - ISBN 978-5-9704-4594-5. - Текст: электронный. http://nbk.pimunn.net/MegaPro/UserEntry?Action=Link_FindDoc&id=163809&idb=0		
2.	Дегтярев, В. П. Нормальная физиология: учебник / В. П. Дегтярев, Н. Д. Сорокина; Дегтярев В. П.; Сорокина Н. Д. - Москва: ГЭОТАР-Медиа, 2019. - 480 с. - ISBN 978-5-9704-5130-4. - Текст: электронный. - URL: https://www.studentlibrary.ru/book/ISBN9785970451304.html .		
3.	Ноздрачев, А. Д. Нормальная физиология: учебник / А. Д. Ноздрачев, П. М. Маслюков - Москва: ГЭОТАР-Медиа, 2021. - 1088 с. - ISBN 978-5-9704-5974-4. - Текст: электронный. - URL: http://www.studmedlib.ru/book/ISBN9785970459744.html		
4.	Мухина, И.В. Физиология дыхания: учебное пособие / И. В. Мухина, О. А. Горева, В. А. Плеханов, Нижегородская государственная медицинская академия. – 5-е изд., доп. и перераб. – Н.Новгород: Изд-во НижГМА, 2014. – 60 с. : ил.	20	5

5.	Физиология человека: Атлас динамических схем : учебное наглядное пособие / К. В. Судаков, В. В. Андрианов, Ю. Е. Вагин, И. И. Киселев ; Судаков К. В. ; Андрианов В. В. ; Вагин Ю. Е. ; Киселев И. И. - Москва : ГЭОТАР-Медиа, 2020. - 416 с. - ISBN 978-5-9704-5880-8. - Текст:электронный.-URL: https://www.studentlibrary.ru/book/ISBN9785970458808.html диа, 2020. - 416 с.		
6.	Холл, Д. Э. Медицинская физиология по Гайтону и Холлу / Д. Э. Холл; Д. Э. Холл. - 2-е, испр. и доп. - М.: Логосфера, 2018. - 1328 с. - ISBN 9785986570600. - Текст: электронный - URL: https://www.books-up.ru/ru/read/medicinskaya-fiziologiya-po-gajtonu-i-hollu-4911587/		
7.	Marieb, Elaine N. Essentials of human anatomy and Physiology +1 electronic disk / E.N. Marieb; Marieb, Elaine N. - 9th ed. - San Francisco: Pearson Benjamin Cummings, 2009. - 632 p.		3
8.	Shier, D. Hole`s essentials of human anatomy & physiology / D. Shier, J. Butler, R. Lewis; Shier, D.; Butler, J.; Lewis, Ricki. - 12th ed. - New York : McGraw-Hill Education, 2015. - 632 p. : il.		1
9.	Waugh, Anne. Ross and Wilson anatomy and physiology in health and Illness / A. Waugh, A. Grant; Waugh, Anne; Grant, A. - 12th ed.- Edinburgh: Churchill Livingstone, 2014. - 509 p		1
10.	Silbernagl, S. Color atlas of physiology / S. Silbernagl, A. Despopoulos. - 6th ed. - Stuttgart: Thieme, 2009. - 441 c		11

8.3. List of guidelines for classroom and independent work of students

No.	Name according to bibliographic requirements	Number of copies	
		At the department	In the library
1.	Physiology practical manual: learning materials for practical classes / I. V. Mukhina; Mukhina, I. V. - N. Novgorod: Publishing House of PRMU, 2019.	20	5

8.4. Electronic educational resources used in the process of teaching the discipline:

8.4.1. Internal Electronic Library System of the University (IELSU)

Name of the electronic resource	Brief description (content)	Access conditions	Number of users
Internal Electronic Library system of the University (In ELS) http://nbk.pimunn.net/MegaPro/Web	Works of the teaching staff of the University: textbooks, textbooks, collections of tasks, methodological manuals, laboratory work, monographs, collections of scientific papers, scientific articles, dissertations, abstracts of dissertations, patents	From any computer and mobile device using an individual login and password. Access mode: http://nbk.pimunn.net/MegaPro/Web	Not limited

8.4.2. Electronic educational resources acquired by University

№	Name of the electronic	Brief description (content)	Access conditions	Number of users
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	resource			
1.	EBS "Student Consultant" (Electronic database "Student Consultant". Database "Medicine. Healthcare (VO) and "Medicine. Healthcare (SPO)") http://www.studmedlib.ru	Educational literature, additional materials (audio, video, interactive materials, test tasks) for higher medical and pharmaceutical education	From any computer and mobile device using an individual login and password. Access mode: http://nbk.pimunn.net/MegaPro/Web	
2.	Database "Doctor's consultant. Electronic Medical Library" https://www.rosmedlib.ru	National guidelines, clinical guidelines, textbooks, monographs, atlases, pharmaceutical reference books, audio and video materials, ICD-10 and ATX	From any computer and mobile device using an individual login and password. Access mode: http://nbk.pimunn.net/MegaPro/Web	Not limited Validity period: until 31.12.2021
3.	Electronic library system "Bukap" https://www.books-up.ru	Educational and scientific medical literature of Russian publishers, including translations of foreign publications. Within the framework of the "Big Medical Library" project, publications of universities participating in the project are available	From any computer and mobile device using an individual login and password; access is automatic from university computers. Publications from the "My Books" section are available for reading. Access mode: http://nbk.pimunn.net/MegaPro/Web	Not limited Validity period: until 31.05.2022
4.	Electronic periodicals as part of the database "Scientific Electronic Library ELibrary" https://elibrary.ru	Electronic medical journals	From university computers. Access mode: https://elibrary.ru	Not limited Validity period: until 31.12.2021
5.	Integrated Information and Library system (IBS) of the scientific and educational medical cluster of the Volga Federal District - "Srednevolzhsky" (contract on a free basis)	Electronic copies of scientific and educational publications from the collections of libraries participating in the scientific and educational medical cluster of the Volga Federal District "Srednevolzhsky"	Access by individual login and password from any computer and mobile device. Access mode: websites of libraries participating in the project	Not limited Validity period: Not limited
6.	National Electronic Library (NEB) (contract on a free basis) http://нэб.рф	Electronic copies of publications (including scientific and educational) on a wide range of knowledge	Scientific and educational works that have not been reprinted in the last 10 years are in the public domain. Works restricted by copyright – from the computers of the scientific library. Access mode: http://нэб.рф	Not limited Validity period: Not limited

8.4.3 Open access resources

No.	Name of the electronic resource	Brief description (content)	Access conditions	Number of users
Domestic resources				
1.	Federal Electronic Medical Library (FEMB) http://нэб.рф	Full-text electronic copies of printed publications and original electronic publications on medicine and biology	From any computer located on the Internet. Access mode: http://нэб.рф	Not limited
2.	Scientific Electronic Library	Abstracts and full texts of scientific publications, electronic	From any computer located on the Internet.	Not limited

	eLIBRARY.RU https://elibrary.ru	versions of Russian scientific journals	Access mode: https://elibrary.ru	
3.	Open Access Scientific Electronic Library CyberLeninka http://cyberleninka.ru	Full texts of scientific articles with annotations published in scientific journals of Russia and neighboring countries	From any computer located on the Internet. Access mode: https://cyberleninka.ru	Not limited
Foreign resources within the framework of a National subscription				
1.	Electronic collection of the publishing house Springer https://rd.springer.com	Full-text scientific publications (journals, books, articles, scientific protocols, conference materials)	From university computers. Access mode: https://rd.springer.com	Not limited

9. Material and technical support for mastering an academic discipline

9.1. List of premises for classroom activities for the discipline

1. A large lecture hall of the Building No.2 (70 Gagarin Ave.) equipped with multimedia equipment and a microphone.

2. Classrooms № 301, 302, 303, 305, 312, 318 of the Building No.2 (70 Gagarin Ave.) for practical classes, consultations, ongoing monitoring and intermediate certification, independent work of students with the ability to connect to the Internet to provide access to the electronic library of the university.

3. Computer class (testing center) (3 Meditsinskaya str.) for test control, with the possibility of connecting to the Internet, conducting independent work and providing access to the electronic library of the university.

9.2. List of equipment for classroom activities for the discipline

No.	Equipment	Meaning	Quantity
1.	Multimedia equipment Epson EB-X72; a laptop (Office Professional Plus 2010, Windows Starter https://www.microsoft.com/Licensing/service/LicensingInfo/LicenseSummary/Summary Kaspersky Endpoint Security for business - Advanced Russian Edition. 150-249Node 1 year Educational Renewal License № 1150170421101518337264)	Lecturing	1
2.	Polygraph BIOPAC MP 30B-CE (Biopac Student Lab 3.7.1 s/n2029; Biopac Student Lab Pro 3.7.1 s/n2029)	Demonstration of methods and results of instrumental studies of physiological functions	1
3.	Computers with screens (Office Professional Plus 2010, Windows Starter https://www.microsoft.com/Licensing/service/LicensingInfo/LicenseSummary/Summary Kaspersky Endpoint Security for Business - Advanced Russian Edition. 150-249Node 1 year Educational Renewal License № 1150170421101518337264)	Processing of scientific and educational information.	5
4.	Testing Center computers (Office 2010, Windows 7 https://www.microsoft.com/Licensing/service)	Conducting independent work with the possibility of connecting to the Internet and providing access to the	16

	LicensingInfo/LicenseSummary/Summary Testing program on the platform Moodle https://moodle.org/?lang=ru)	electronic library of the university	
5.	Electrocardiographs ЭКГТ-1/3-07	ECG registration	10
6.	Neurological hammers	The study of human reflexes	5
7.	Tonometers	Blood pressure measurement	25
8.	Tonometers OMRON RX-3	Blood pressure measurement	1
9.	Electrocoagulographs H334	Study of hemocoagulation	4
10.	Pneumotachometers ПТ-1	Breath research	5
11.	Perimeters	Definition of visual fields	5
12.	Panchenkov's apparatus	Determination of ESR	5
13.	Pulsoximeters	Determination of saturation	5
14.	Tuning forks	The study of sound conduction	7

10. List of changes to the working program "Research methods of physiological functions"

Federal State Budgetary Educational Institution of Higher Education
"Privolzhsky Research Medical University"
Ministry of Health of the Russian Federation
(FSBEI HE "PRMU" of the Ministry of Health of Russia)

Department of
Normal Physiology named after N.Yu. Belenkov

CHANGE REGISTRATION SHEET

working program for the academic discipline
RESEARCH METHODS OF PHYSIOLOGICAL FUNCTIONS

Field of study / specialty / scientific specialty: _____ **GENERAL MEDICINE (31.05.01)**
(code, name)

Training profile: _____
(name) - for master's degree programs

Mode of study: _____ full-time _____
full-time/mixed attendance mode/extramural

Position	Number and name of the program section	Contents of the changes made	Effective date of the changes	Contributor's signature
1	Correct paragraph 8.1 "List of key literature" and 8.2 "Additional reading" (Appendix 1)	Corrections in the list of literature	29.08.2022	Volkova I.F.

Approved at the department meeting
Protocol No. _____ of _____ 20__

Head of the Department of Normal Physiology
named after N.Yu. Belenkov, PhD, DrSci, Prof. _____ / Mukhina I.V.
signature

Appendix 1

8. Educational, methodological and informational support of the discipline (printed, electronic publications, the Internet and other network resources).

8.1. List of core literature

No.	Name according to bibliographic requirements	Number of exemplars	
		At the department	In the library
1.	Costanzo, Linda S. Physiology / L.S. Costanzo; Costanzo, Linda S. - 6th ed. - Philadelphia : Elsevier, 2018. - 516 p	1	180
2.	Физиология с основами анатомии: учебник / под ред. А. И. Тюкавина, В. А. Черешнева, В. Н. Яковлева, И. В. Гайворонского. - М. : ИНФРА-М, 2020. - 574 с. 1 45	1	45

8.2. List of accessory literature:

No.	Name according to bibliographic requirements	Number of exemplars	
		At the department	In the library
1	Гайворонский, И. В. Анатомия и физиология человека: учебник / И. В. Гайворонский ; Гайворонский И. В. - Москва : ГЭОТАР-Медиа, 2019. - 672 с. - ISBN 978-5-9704-4594-5. - Текст: электронный. http://nbk.pimunn.net/MegaPro/UserEntry?Action=Link_FindDoc&id=163809&idb=0		
2	Hall, John E. Textbook of medical physiology / J.E. Hall, A.C. Guyton; Hall, John E. ; Guyton, Arthur C. - 13th ed. - Philadelphia : Elsevier, 2016. - 1145 p.	2	100
3	Дегтярев, В. П. Нормальная физиология: учебник / В. П. Дегтярев, Н. Д. Сорокина ; Дегтярев В. П. ; Сорокина Н. Д. - Москва : ГЭОТАР-Медиа, 2019. - 480 с. - ISBN 978-5-9704-5130-4. - Текст: электронный. - URL: https://www.studentlibrary.ru/book/ISBN9785970451304.html .		
4	Ноздрачев, А. Д. Нормальная физиология: учебник / А. Д. Ноздрачев, П. М. Маслюков - Москва: ГЭОТАР-Медиа, 2021. - 1088 с. - ISBN 978-5-9704-5974-4. - Текст : электронный. - URL: http://www.studmedlib.ru/book/ISBN9785970459744.html		
5	Мухина, И.В. Физиология дыхания: учебное пособие / И. В. Мухина, О. А. Горева, В. А. Плеханов, Нижегородская государственная медицинская академия. – 5-е изд., доп. и	20	5

	перераб. – Н.Новгород: Изд-во НижГМА, 2014. – 60 с.: ил.		
6	Физиология человека: Атлас динамических схем : учебное наглядное пособие / К. В. Судаков, В. В. Андрианов, Ю. Е. Вагин, И. И. Киселев ; Судаков К. В. ; Андрианов В. В. ; Вагин Ю. Е. ; Киселев И. И. - Москва : ГЭОТАР-Медиа, 2020. - 416 с. - ISBN 978-5-9704-5880-8. - Текст:электронный.-URL: https://www.studentlibrary.ru/book/ISBN9785970458808.html диа, 2020. - 416 с.		
7	Холл, Д. Э. Медицинская физиология по Гайтону и Холлу / Д. Э. Холл ; Д. Э. Холл. - 2-е, испр. и доп. - М. : Логосфера, 2018. - 1328 с. - ISBN 9785986570600. - Текст : электронный - URL: https://www.books-up.ru/ru/read/medicinskaya-fiziologiya-po-gajtonu-i-hollu-4911587/		
8	Shier, D. Hole`s essentials of human anatomy & physiology / D. Shier, J. Butler, R. Lewis; Shier, D. ; Butler, J. ; Lewis, Ricki. - 12th ed. - New York : McGraw-Hill Education, 2015. - 632 p. : il.		1
9	Waugh, Anne. Ross and Wilson anatomy and physiology in health and illness / A. Waugh, A. Grant; Waugh, Anne ; Grant, A. - 12th ed.- Edinburgh : Churchill Livingstone, 2014. - 509 p		1

9.3. A set of licensed and freely distributed software, including domestic production

Item no.	Software	number of licenses	Type of software	Manufacturer	Number in the unified register of Russian software	Contract No. and date
1	Wtware	100	Thin Client Operating System	Kovalev Andrey Alexandrovich	1960	2471/05-18 from 28.05.2018
2	MyOffice is Standard. A corporate user license for educational organizations, with no expiration date, with the right to receive updates for 1 year.	220	Office Application	LLC "NEW CLOUD TECHNOLOGIES"	283	without limitation, with the right to receive updates for 1 year.
3	LibreOffice		Office Application	The Document Foundation	Freely distributed software	

4	Windows 10 Education	700	Operating systems	Microsoft	Azure Dev Tools for Teaching Subscription	
5	Yandex. Browser		Browser	«Yandex»	3722	
6	Subscription to MS Office Pro for 170 PCs for FGBOU VO "PIMU" of the Ministry of Health of Russia	170	Office Application	Microsoft		23618/HN10030 LLC "Softline Trade" from 04.12.2020