Federal State Autonomous Educational Institution of Higher Education
PEOPLES' FRIENDSHIP UNIVERSITY OF RUSSIA named after
Patrice Lumumba
RUDN University

Institute of Medicine

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

COURSE SYLLABUS

Basics of psychophysiology

course title

Recommended by the Didactic Council for the Education Field of:

31.05.01 General Medicine

field of studies / speciality code and title

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

General Medicine

higher education programme profile/specialisation title

2023-2024

1. COURSE GOAL(s)

The goal of the course «Basics of psychophysiology» is to equip students with the knowledge about the physiological mechanisms of mental processes at the level of membranes, synapses, neurons, nerve centers and the central nervous system.

2. REQUIREMENTS FOR LEARNING OUTCOMES

Mastering the course (module) «Basics of psychophysiology» is aimed at the development of the following competences /competences in part: General Professional Competences- (GPC)-5.

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

Competence code	Competence descriptor	Competence formation indicators (within this course)
GPC-5	Able to assess morpho-functional, physiological states and pathological processes in the human body to solve professional problems	C-5.1. Mastering the algorithm of clinical, laboratory and functional diagnosis when dealing with professional tasks.
		C-5.3. Being able to determine 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 code	Competence descriptor	Previous courses/modules*	Subsequent courses/modules*
GPC-5	GPC-5. Able to assess morphofunctional, physiological	Biology Molecular genetics in practical biology and medicine,	Pathophysiology, Clinical pathophysiology, Propedeutics of Internal Medicine,

	conditions and pathological processes in the human body to solve professional problems	Medical elementology	General surgery, Topographic anatomy and operative surgery, Dermatovenereology, Neurology, Medical genetics, Neurosurgery, Ophthalmology, Forensic Medicine, Faculty therapy, Faculty surgery, Occupational diseases, Hospital therapy, Anesthesiology, resuscitation, intensive care, Hospital surgery, Pediatric surgery Oncology, Radiation therapy, Maxillofacial Surgery

* To be filled in regarding the higher education programme correspondence training mode.

4. COURSE WORKLOAD AND ACADEMIC ACTIVITIES

The total workload of the course "Basics of Psychophysiology" is 2 credits (72 academic hours).

*Table 4.1. Types of academic activities during the periods of higher education programme mastering (**__full-time training__**)**

Type of academic activities		Total academic hours	Semesters/training modules
			3
Classroom learning , *ac.h.*		**34**	*34*
Including:			
Lectures (LC)			
Lab work (LW)			
Seminars (workshops/tutorials) (S)		**34**	34
Self-studies		*38*	38
Evaluation and assessment (exam/passing/failing grade)			
Course workload	academic hours	**72**	**72**
	credits	**2**	**2**

* To be filled in regarding the higher education programme correspondence training mode.

5. COURSE CONTENTS

Table 5.1. Course contents and academic activities types

Course module title	Course module contents (topics)	Academic activities types
Module 1. **Basic approaches to the study of psychophysiological mechanisms**	Topic 1.1. Hierarchy of physiological processes in the CNS. System approach in psychophysiology. Behavior. Factors that shape human behavior.	S
	Topic 1.2. Memory. Types of memory. Modern ideas about the formation of memory. Functional and morphological changes in the structures of the nervous system during short-term and long-term memorization.	S
	Topic 1.3. Motivation. functional system. The purpose of the action. Leading reflection. Action acceptor. Action programming. Reinforcement. Reverse Afferentation. Systemogenesis. System specialization of neurons.	S
	Topic 1.4. Interaction of cognitive systems in purposeful behavior. The concept of the psyche. Origin and development of the psyche in phylogenesis. The problem of qualitative originality of the human psyche. The structure of the human psyche.	S
Module 2. **Psychophysiology of emotions**	Topic 2.1. Theories of emotions. Neuroanatomy of emotions. Biologically and socially significant stimuli as a source of emotions. Need-informational factors of the emergence of emotions. Cognitive processes in the genesis of emotions.	S
	Topic 2.2. Expression of emotions in animals and humans. Means of non-verbal, emotional communication. Correlation of facial muscle activity and emotions. Functional asymmetry and emotions. individual differences and emotions. Influence of extraversion, introversion, anxiety.	S
	Topic 2.3. Sex differences in emotions. Centers of positive and negative emotions. Self-irritation. Limbic system. Central vegetative network.	S

Course module title	Course module contents (topics)	Academic activities types
Module 3. **Psychophysiology of thinking and speech**	Topic 3.1. Signaling systems according to I.P. Pavlov. Interaction of the first and second signal systems. Symbolic display of the stimulus. The development of speech. Perception of speech signals. Wernicke Center. Oral speech. Generation of reactions of the second signaling system with the participation of command neurons: articulation, gestures, written signs. Broca's area.	S
	Topic 3.2. Readiness potential. Motor potential. Semantic evoked potential. Inner speech. Thinking as externally unexpressed operations with traces of memory. Areas of brain activity and thinking. Functional asymmetry of the brain and features of intellectual activity. Verbal and non-verbal intelligence.	S
	Topic 3.3. The main provisions of the theory of activity of A.N. Leontiev. Needs, motives, emotions, personal meaning. The structure of human consciousness according to A.N. Leontiev. Concepts of individuality, temperament, character and personality.	S
Module 4. **Methods of psychophysiological research**	Topic 4.1. Non-electrophysiological methods in psychophysiology. Pneumography. Plethysmography. X-ray computed tomography. Structural magnetic resonance imaging (MRI). Positron emission tomography (PET). Functional magnetic resonance imaging (fMRI). Eye tracking. Electrophysiological techniques: GSR, electrooculography, Electromyography. Electrocardiography.	S
	Topic 4.2. Electroencephalography (EEG). Schemes of setting electrodes (standard installations). Basic EEG rhythms, age norms and differences. EEG in states: active, relaxed wakefulness, drowsiness, non-REM and REM sleep. Spectral analysis of the EEG and its application in psychophysiology. Interhemispheric asymmetry on the EEG.	S

Course module title	Course module contents (topics)	Academic activities types
	Evoked potentials of the brain, recorded by the encephalograph. Averaging technique.	
	Topic 4.3. Differences between visual, auditory and somatosensory evoked potentials. Computer mapping of the brain. Polygraphy.	S
Module 5. Principles of polygraphic examination (instrumental lie detection)	Topic 5.1. Theoretical foundations of instrumental «lie detection». The main methodological difficulties and errors that arise during polygraph tests. Ways to counter the polygraph.	S
	Topic 5.2. General requirements for compiling a questionnaire for printing. Classical methods and tests of polygraph checks, advantages and disadvantages. Methodical methods of technique of control questions. Using the phenomenon of set in the practice of instrumental lie detection.	S
	Topic 5.3. Using the features of cognitive processes (sensation, perception, attention, memory) in the practice of polygraph tests.	S

* - 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)
Lecture	An auditorium for lecture-type classes, equipped with a set of specialized furniture; board (screen) and technical means of multimedia presentations.	
Seminar	Audience for conducting seminar-type classes, group and individual consultations, current control and intermediate certification, equipped with a set	A set of specialized furniture; technical means: multimedia projectors «Optoma», «View Sonic» columns «Genius», «Dialog» nettops Lenovo, PVEM «SM»

Type of academic activities	Classroom equipment	Specialised educational / laboratory equipment, software, and materials for course study (if necessary)
	of specialized furniture and technical means for multimedia presentations (114, 116, 126, 127)	electric wall screens «Digis» . Educational computer programs used in practical classes: testing program «Mytest».
Lab work	An auditorium for laboratory work, individual consultations, current control and intermediate certification , equipped with a set of specialized furniture and equipment (114, 116, 126, 127)	A set of specialized furniture; technical means: multimedia projectors «Optoma», «View Sonic» columns «Genius», «Dialog» nettops Lenovo, PVEM «SM» electric wall screens «Digis». Educational computer programs used in practical classes: testing program «Mytest». Technical means: a complex for laboratory work, training films, a universal stand, a set of tables, universal indicator paper (pH), test strips for determining urine components, a neurological hammer, a set of tuning forks, a hand dynamometer, a multimedia installation, anti- A, Anti-B and anti-AB for determining blood groups according to the ABO system, anti-D coliclone for determining the Rh factor according to the Rhesus system, EK1T-O7 and Axion electrocardiographs, sphygmomanometer, phonendoscope, air spirometer, stopwatch, Forster`s perimeter, Sivtsev`s tables, portable glucometer, electroencephalograph.
Self-studies	An auditorium for independent work of students (can be used for seminars and consultations), equipped with a set of specialized furniture and computers with access to EIOS (127)	A set of specialized furniture; technical means: multimedia projector «Optoma», «Genius» speakers ,_ «Lenovo» nettop, electric wall screen

7. RESOURCES RECOMMENDED FOR COURSE STUDY

Main readings:

1. Nikolaeva E. Psychophysiology: a textbook for universities / E. Nikolaeva. - St. Petersburg: Peter, 2019. - 704 p. : ill. - (Textbook for universities). - ISBN 978-5-4461-0880-0 : 1549.50.
Additional readings:
1. Krol Vladimir Mikhailovich. Psychophysiology: textbook / V.M. Krol, M.V. Vikha. - Electronic text data. - M. : KnoRus, 2017. - 504 p. : ill. - (Bachelor's degree). - ISBN 978-5-406-03282-4: 908.49. http://lib.rudn.ru/MegaPro/UserEntry?Action=Rudn_FindDoc&id=455516&idb=0

Resources of the information and telecommunications network "Internet":
1. Electronic libraries with access for RUDN students:
   -Electronic library network of RUDN – ELN RUDN http://lib.rudn.ru/MegaPro/Web
   - ELN «University Library online» http://www.biblioclub.ru
   - ELN Urait http://www.biblio-online.ru
   - ELN «Student Advisor» www.studentlibrary.ru
   - ELN «Lan» http://e.lanbook.com/

2. Databases and search engines:
   - electronic fund of legal and regulatory and technical documentation http://docs.cntd.ru/
   - search system Yandex https://www.yandex.ru/
   - search system Google https://www.google.ru/
   - abstract database SCOPUS http://www.elsevierscience.ru/products/scopus/
   - **NCBI:** https://p.360pubmed.com/pubmed/
   - **RUDN University Bulletin:** access mode from the RUDN University territory and remotely http://journals.rudn.ru/
   - **Library Elibrary.ru:** access on IP-addresses of People's Friendship University of address: http : //www.elibrary.ru/defaultx.asp
   -ScienceDirect (ESD), «FreedomCollection», «Cell Press» ID Elsevier». There is remote access to the database, access by IP-addresses of RUDN University (or remotely by individual login and password).
   - Google Academy (eng. Google Scholar) - a free search engine for full texts of scientific publications of all formats and disciplines. Indexes full texts of scientific publications. Access mode: https://scholar.google.ru/
        - Web of Science . There is remote access to the database. Access to the platform is carried out by IP-addresses of the RUDN University or remotely. Remote access to WOS is activated without administrator intervention after registering on the platform from RUDN University http://login.webofknowledge.com/

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

1. The set of lectures on the course "Basics of psychophysiology"

* 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-5) 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:

Associate Professor of the Department of Normal Physiology		E.B. Yakunina
position, department	signature	name and surname

Professor of the Department of Normal Physiology		D.S. Sveshnikov
position, department	signature	name and surname

HEAD of the Department:

of Normal Physiology		V.I. Torshin
name of department	signature	name and surname

HEAD of the Higher Education Program:

First Deputy Director of Medical Institute		Iv.V.Radysh
position, department	signature	name and surname