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**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

Pathophysiology, Clinical Pathophysiology

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 “Pathophysiology, Clinical Pathophysiology” is to equip students with knowledge of the reasons, mechanisms of development and outcomes of standard pathological processes and diseases of separate bodies and systems which basis they make, including: - studying of molecular, cellular, fabric, organ, system and intersystem mechanisms of standard pathological processes; - studying of the reasons, mechanisms of development and outcomes of the concrete diseases developing in separate bodies and systems; - analysis of the nature of clinical manifestations of the main pathological processes;- acquaintance with the principles of pathogenic therapy of diseases of separate bodies and systems.

2. REQUIREMENTS FOR LEARNING OUTCOMES

Mastering the course (module) “Pathophysiology, Clinical Pathophysiology” is aimed at the development of the following competences /competences in part: GC-1; GPC-5; PC-2.

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

| Competence code | Competence descriptor | Competence formation indicators (within this course) |
|------------------------|---|---|
| GC-1. | Being able to implement critical analysis of problem situations based on systems approach, develop an action strategy | GC-1.2. Assessing in a critical way the reliability of information sources, working with contradictory information from different sources. |
| GPC-5. | Being able to assess morpho-functional, physiological conditions and pathological processes in the human body to solve professional tasks | GPC-5.1. Mastering the algorithm of clinical, laboratory and functional diagnosis when dealing with professional tasks. |
| | | GPC-5.2. Being able to evaluate the results of clinical, laboratory and functional diagnosis when dealing with professional tasks. |
| | | GPC-5.3. Being able to determine morpho-functional, physiological states and pathological processes of the human body. |
| PC-2. | Being able to examine a patient in order to determine a diagnosis | PC-2.7. Being able to carry out differential diagnosis with other diseases/conditions, including the urgent ones, as well as to make a diagnosis taking into account the current international statistical classification of diseases and problems related to health (ICD). |

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* |
|------------------------|---|--|--|
| GC-1. | Being able to implement critical analysis of problem situations based on systems approach, develop an action strategy | <i>Philosophy History of medicine Psychology and pedagogy Physics Maths Biochemistry Immunology</i> | <i>Hygiene Propaedeutics of internal diseases Public health and healthcare, health economics Epidemiology Neurology, medical genetics, neurosurgery Emergency Medicine hospital therapy Endocrinology infectious diseases Phthysiology Anesthesiology, resuscitation, intensive care Allergology Medical Enzymology</i> |
| GPC-5. | Being able to assess morpho-functional, physiological conditions and pathological processes in the human body to solve professional tasks | <i>Biochemistry Biology Normal physiology Microbiology, virology Pathological anatomy, clinical pathological anatomy Medical Enzymology Fundamentals of Integrative Medicine</i> | <i>General surgery Dermatovenereology Neurology, medical genetics, neurosurgery Faculty Surgery Occupational diseases hospital therapy Anesthesiology, resuscitation, intensive care Hospital surgery, pediatric surgery Oncology, radiation therapy obstetrics and gynecology Maxillofacial Surgery reproductive health</i> |

| | | | |
|-------|---|------------------------|--|
| | | | <p><i>Molecular genetics in practical biology and medicine</i></p> <p><i>Fundamentals of psychophysiology</i></p> <p><i>Physician Assistant: Physician Assistant</i></p> <p><i>Ophthalmology</i></p> <p><i>Faculty Therapy</i></p> <p><i>Maxillofacial Surgery</i></p> |
| PC-2. | Being able to examine a patient in order to determine a diagnosis | <i>General surgery</i> | <p><i>Radiation diagnostics</i></p> <p><i>general surgery</i></p> <p><i>Dermatovenereology</i></p> <p><i>Neurology, medical genetics, neurosurgery</i></p> <p><i>Otorhinolaryngology</i></p> <p><i>Ophthalmology</i></p> <p><i>Faculty Therapy</i></p> <p><i>Faculty Surgery</i></p> <p><i>Occupational diseases</i></p> <p><i>hospital therapy</i></p> <p><i>Endocrinology</i></p> <p><i>outpatient therapy</i></p> <p><i>Anesthesiology, resuscitation, intensive care</i></p> <p><i>Hospital surgery, pediatric surgery</i></p> <p><i>Oncology, radiation therapy</i></p> <p><i>Traumatology, orthopedics</i></p> <p><i>obstetrics and gynecology</i></p> <p><i>Pediatrics</i></p> <p><i>Maxillofacial Surgery</i></p> <p><i>Sectional course</i></p> <p><i>reproductive health</i></p> <p><i>Current issues of neonatology</i></p> <p><i>Topical Issues of Neonatology / Topical Issues of Neonatology</i></p> <p><i>Fundamentals of childhood nutrition</i></p> <p><i>Practice of a surgical profile: assistant surgeon</i></p> |

| | | | |
|--|--|--|---|
| | | | <i>Practice in obstetrics and gynecology: assistant gynecologist</i> <i>Physician Assistant: Physician Assistant</i> <i>Practice of general medical profile: assistant doctor of an outpatient clinic</i> <i>Obstetrics and Gynecology Practice: Obstetrician Assistant</i> <i>General practice: pediatrician's assistant</i> |
|--|--|--|---|

* 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 “Pathophysiology, Clinical Pathophysiology” is 8 credits (288 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 | | | |
|---|----------------------|----------------------------|------------|------------|--|
| | | 5 | 6 | | |
| <i>Contact academic hours</i> | 175 | 90 | 85 | | |
| including: | | | | | |
| Lectures (LC) | 35 | 18 | 17 | | |
| Lab work (LW) | 140 | 72 | 68 | | |
| Seminars (workshops/tutorials) (S) | | | | | |
| <i>Self-studies</i> | 105 | 50 | 55 | | |
| <i>Evaluation and assessment (exam/passing/failing grade)</i> | 8 | 4 | 4 | | |
| Course workload | academic hours | 288 | 144 | 144 | |
| | credits | 8 | 4 | 4 | |

5. COURSE CONTENTS

Table 5.1. Course contents and academic activities types

| Course module title | Course module contents (topics) | Academic activities types |
|--------------------------------------|--|---------------------------|
| Module 1 General nosology. | Topic 1.1. Conceptions of health and disease. Sano- и pathogenesis. | LC, LW |
| | Topic 1.2. Pathology of cellular biomembranes and organells. Types and mechanisms of cell death. Disorders of biorhythms of a cell. | LC |

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|--|---|--------|
| Module 2 Non-specific pathological processes | Topic 2.1. Disorders of local blood circulation. | LW |
| | Topic 2.2. Inflammation. | LW |
| | Topic 2.3. Immunity. Immunopathology. | LC, LW |
| | Topic 2.4. Allergy. | LC, LW |
| | Topic 2.5. Pathophysiology of tumor growth. | LC, LW |
| Module 3 Non-specific metabolic disorders | Topic 3.1. Hypoxia. | LC, LW |
| | Topic 3.2. Pathology of body thermoregulation. Fever. | LC, LW |
| | Topic 3.3. Pathophysiology of carbohydrate metabolism. Diabetes mellitus. | LW |
| | Topic 3.4. Pathology of a water-salt exchange. Edema. Pathophysiology of acid-base balance. | LW |
| | Topic 3.5. Integral mechanisms of metabolic disorders. | LC |
| | Topic 3.6. Pathophysiology of lipid, protein and purine metabolism. | LW |
| Module 4 Extreme states | Topic 4.1. Pathophysiology of extreme states. | LC |
| | Topic 4.2. Stress. Shock. Collapse. Coma. Dying and revival of an organism. Apparent and natural death. Principles of resuscitation. | LW |
| | Topic 4.3. “Diseases of civilization”. Chronopathology. | LW |
| | Topic 4.5. Ecological pathophysiology | LC |
| Module 5 Pathophysiology of the | Topic 5.1. Anemias. Hemoblobonosis. Hemoglobinopathies. | LW |

| | | |
|---|--|--------|
| hematopoietic system | Topic 5.2. Leukocytosis. Leukopenia. Leukemias. | LW |
| | Topic 5.3. Clinical tasks in the pathophysiology of the hematopoietic system. | LW |
| | Topic 5.4. Hemorrhagic diatheses. | LC |
| Module 6 Pathophysiology of the cardiovascular and respiratory systems. | Topic 6.1. Arrhythmias. | LW |
| | Topic 6.2. Coronary heart disease. Coronarogenic and noncoronarogenic necrosis of the myocardium. Complications of myocardial infarction. | LW |
| | Topic 6.3. Sudden cardiac death. | LC |
| | Topic 6.4. Heart defects. Cardiomyopathies. Myocarditis. Endocarditis. Pericarditis. | LC, LW |
| | Topic 6.5. Heart failure. Pathophysiology of respiration. | LW |
| | Topic 6.6. Pathophysiology of bronchial obstruction syndromes. | LC |
| | Topic 6.7. Pathophysiology of vascular tonus. | LC |
| | Topic 6.8. Pathophysiology of the vascular wall. Atherosclerosis. | LC, LW |
| Module 7 Pathophysiology of the gastrointestinal tract | Topic 7.1. Non-specific dysfunctions of the gastrointestinal tract. | LC |
| | Topic 7.2. Acute and chronic gastritis. Peptic ulcer. Diseases of the operated GIT. | LW |
| | Topic 7.3. Pathophysiology of the liver and bile ducts. Jaundice. Hepatic failure. Pathophysiology of cholecystitis. Pathophysiology of the pancreas. Intestinal obstruction. | LW |
| Module 8 Pathophysiology of the excretory system | Topic 8.1. Non-specific disorders of the excretory function of the kidneys. | LC |
| | Topic 8.2. Nephrotic syndrome. Nephritic syndrome. Acute and chronic diffuse glomerulonephritis. Pyelonephritis. Urolithiasis. Acute and chronic renal failure. Uremia. Renal coma. | LW |

| | | |
|---|---|----|
| Module 9 Pathophysiology of the endocrine system | Topic 9.1. General mechanisms of endocrine disorders. Pathophysiology of the hypothalamic, pituitary and adrenal systems. | LW |
| | Topic 9.2. Pathophysiology of thyroid, parathyroid glands, thymus, epiphysis and gonads. | LW |
| Module 10 Pathophysiology of the nervous system and higher nervous activity | Topic 10.1. Pathophysiology of functional neuroses. Pathological reflexes. Pathophysiology of drug addiction. Pathophysiology of alcoholism. | LW |
| | Topic 10.2. Pathophysiology of CNS and neuroses. | LC |

* - 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) |
|-----------------------------|---|---|
| Lab work | Classroom for seminars, workshops, lab works, group and individual consultations, evaluation and assessment, equipped with a set of specialized furniture; whiteboard; a set of devices includes portable multimedia projector, laptop, projection screen, stable wireless Internet connection. (rooms: 214, 215) | Metabolic chamber for rats, AE0906 (3 pcs.) Metabolic chamber for rats (2 pcs.) Operating light ALFA-734 Cage for keeping rodents (6 pcs.) Exhaust module Lab-1500 ShV Projector Epson EB-X03 LCD 2700Lm (1024x768) Notebook Dell Vostro 5581 |
| Seminar | Classroom for seminars, workshops, lab works, group and individual consultations, evaluation and assessment, equipped with a set of specialized furniture; whiteboard; a set of devices includes portable multimedia projector, laptop, projection screen, stable wireless Internet connection. (room: 213) | Electric screen Projecta Elpro Electrol 200x200cm Matte White S ViewSonic PA503S Projector + Digis DSM-2 Ceiling Mount Adjustable Ceiling Mount Notebook Dell Vostro 5581 LMC-100109, Lumien Master Control Screen LMC-100109 183x244 cm Matte White FiberGlass, Motorized Software: Microsoft products |

| | | |
|--------------|---|--|
| | | (OS, office suite, including MS Office/Office 365, Teams, Skype) |
| Computer Lab | Computer Lab for seminars, workshops, group and individual consultations, evaluation and assessment, equipped with a set of specialized furniture; whiteboard; a set of devices includes portable multimedia projector, laptop, 9 sets of computer + system unit, projection screen, stable wireless Internet connection. (room: 213) | ViewSonic PA503S Projector + Digis DSM-2 Ceiling Mount Adjustable Ceiling Mount Computer MATX Super Power QM 104A11500WP4 USB/AV, Internet access. Screen with electric wire Draper198X264 Software: Microsoft products (OS, office suite, including MS Office/Office 365, Teams, Skype) Complete SPARK system unit (10 pcs.) Monitor 17" TFT Proview (10 pcs.) |
| Self-studies | Classroom for self-studies (can be used for seminars, workshops, lab works, group and individual consultations,), equipped with a set of specialized furniture; whiteboard; a set of devices includes portable multimedia projector, laptop, projection screen, stable wireless Internet connection. (room: 212) | ViewSonic PA503S Projector + Digis DSM-2 Ceiling Mount Adjustable Ceiling Mount Computer MATX Super Power QM 104A11500WP4 USB/AV, Internet access. Screen with electric wire Draper198X264 Software: Microsoft products (OS, office suite, including MS Office/Office 365, Teams, Skype) Complete SPARK system unit (10 pcs.) Monitor 17" TFT Proview (10 pcs.) |
| | | |

7. RESOURCES RECOMMENDED FOR COURSE STUDY

Main readings:

1. Robbins&Cotran Pathologic Basis of Disease/editors V. Kumar, A.K. Abbas, J.C. Aster, J.R. Turner.- 10ed. – Elsevier, 2021. – 1379p.: - ISBN 978-0-323-53113-9: 12184.04.

2. Mohan Harsh. Textbook of pathology. - New Delhi : Jaypee Brothers Medical Publishers Ltd., 2010. - 6 th ed. - 933 p.: il.

3. Mohan Harsh. Textbook of pathology. - New Delhi : Jaypee Brothers Medical Publishers Ltd., 2015. - 7 th ed. - 954 p.: il.

4. Mohan Harsh. Textbook of pathology. - New Delhi : Jaypee Brothers Medical Publishers Ltd., 2015. - 7 th ed. - 665 p.: il. Supplement

Additional readings:

Litvitskiy P.F., Pathophysiology : lectures, tests, tasks / Litvitskiy P.F., Pirozhkov S.V., Tezikov E.B. - M. : GEOTAR-Media, 2016. - 432 p. - ISBN 978-5-9704-3600-4.

<http://www.studmedlib.ru/book/ISBN9785970436004.html>

(In English)

Electronic source:

http://lib.rudn.ru/MegaPro/UserEntry?Action=Rudn_FindDoc&id=475793&idb=0

The specified educational editions are available in the Scientific Library of Peoples' Friendship University of Russia and at V.A. Frolov Department of general pathology and pathological physiology.

Internet-(based) sources

1. Electronic libraries with access for RUDN students
- Electronic Library System (ELS) of the RUDN University
<http://lib.rudn.ru/MegaPro/Web>

- ELS "University Library Online" <http://www.biblioclub.ru>

- ELS Jurait <http://www.biblio-online.ru>

- ELS «Student consultant» www.studentlibrary.ru

- ELS «Lan» <http://e.lanbook.com/>

2. Databases and search engines:

- electronic fund of legal and regulatory technical documentation <http://docs.cntd.ru/>

- Yandex search engines <https://www.yandex.ru/>

- Google search engine <https://www.google.com/>

- reference database SCOPUS <http://www.elsevierscience.ru/products/scopus/>

- WHO documentation center <http://whodc.mednet.ru/>

- Springer <https://rd.springer.com/>

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

1. The set of lectures on the course “Pathophysiology, Clinical Pathophysiology”

* 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 (GC-1; GPC-5; PC-2.) 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:

Assistant professor of
V.A. Department
of General Pathology and
Pathological Physiology

position, department

signature

V.A. Goryachev

name and surname

Head of V.A. Department
of General Pathology and
Pathological Physiology

position, department

signature

M.L. Blagonravov

name and surname

HEAD OF EDUCATIONAL DEPARTMENT:

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HEAD

OF HIGHER EDUCATION PROGRAMME:

First Deputy Director of Medical

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