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ФИО: Ястребов Олег Александрович
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**Federal State Autonomous Educational Institution of Higher Education
Peoples' Friendship University of Russia
named after Patrice Lumumba
RUDN**

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

1. COURSE GOAL(s)

The goal of the course «Pathophysiology, clinical pathophysiology» is to gain an understanding 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

The course «Pathophysiology, clinical pathophysiology» is designed for students to acquire following competences: **UC-1; GPC-5; PC-2;**

Table 2.1. List of competences that students acquire during the course

Competence code	Competence descriptor	Competence formation indicators (within this course)
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, internships*	Subsequent courses/modules, internships*
GPC-5.	Being able to assess morpho-functional, physiological conditions and pathological processes in the human body to solve professional tasks	<i>Biochemistry; Normal physiology; Biology; Microbiology, virology; Propaedeutics of internal diseases; Chemistry; Bioorganic chemistry; Anatomy; Histology, embryology, cytology;</i>	<i>Obstetrics and Gynecology; Oncology, Radiation Therapy; Molecular Genetic Methods; Microbiological Diagnostics; Phthisiology; Anesthesiology, Intensive Care, Intensive Therapy; Ophthalmology; Cell Biology and Histology; Topographic Anatomy and Operative Surgery; Forensic Medicine; Maxillofacial Surgery; Medical Criminology; Otorhinolaryngology; Pediatrics; Sectional Course.</i>
PC-2.	Being able to examine a patient in order to determine a diagnosis	<i>Propaedeutics of Internal Diseases; Microbiology, Virology; Molecular Genetics in Practical Biology and Medicine**</i>	<i>Surgical Practice: Assistant Surgeon; Assistant Physician of the Therapeutic Profile: Assistant Physician of the Therapist; General Medical Practice: Assistant to an Outpatient Clinic Doctor; Practice of Obstetric and Gynecological Profile: Assistant Obstetrician; Practice of Obstetrics and Gynecology Profile: Assistant to a Gynecologist; General Medical Practice: Assistant Pediatrician; Dermatovenereology; Neurology, Medical Genetics, Neurosurgery; Ophthalmology; Faculty Surgery; Occupational Diseases; Hospital Therapy; Endocrinology; Outpatient Therapy; Hospital Surgery, Pediatric Surgery; Pediatrics; Obstetrics and Gynecology; Anesthesiology, Intensive</i>

			<i>Care, Intensive Care; Oncology, Radiation Therapy; Otorhinolaryngology; Reproductive Health; Traumatology, Orthopedics; Faculty Therapy; Maxillofacial Surgery; General Medical Skills; Urgent Conditions; Urology; Infectious Diseases; Psychiatry, Medical Psychology; Allergology; Phthisiology; Endoscopic Urology; Telemedicine; Clinical Dentistry; Current Issues of Neonatology; Topical Issues in Neonatology; Cardiology in Quests; Molecular Genetic Methods; Microbiological Diagnostic Methods; Evidence-Based Medicine; Sectional Cour; Clinical radiology; Outpatient pulmonology.</i>
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* To be filled in according with 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.

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

Type of workload		Total hours	Semesters			
			5	6		
<i>Class hours (All)</i>		175	90	85		
Include:						
Lectures (LC)		0	0	0		
Laboratory research (LW)		0	0	0		
Seminars (workshops/tutorials) (S)		175	90	85		
<i>Independent work (total)</i>		47	42	5		
<i>Control (exam / test with assessment)</i>		30	12	18		
Total labor input						
	academic hours	252	144	108		

	credits	7	4	3		
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5. COURSE CONTENTS

Table 5.1. The content of the course module

Name of the module of course	Topic name Contents of the section	Types of workload *
Module 1 General nosology.	Topic 1.1. Conceptions of health and disease. Sano- и pathogenesis. Concepts: "Health", "Disease", "Etiology", "Pathogenesis", "Sanogenesis", "Reactivity". Classification of mechanisms of sanogenesis. Periods of illness.	PT
Module 2 Non-specific pathological processes	Topic 2.1. Cellular pathology. Pathology of cell membranes. Pathology of the cell nucleus. Pathology of mitochondria. Pathology of the endoplasmic reticulum. Pathology of lysosomes. Pathology of the cytoskeleton and contractile apparatus of the cell. Mechanisms and morphological manifestations of necrosis. Cell apoptosis. Disorders of cell biorhythms. Disorders of humoral and nervous regulation of cells. Cell pathology and disease. Lysosomal storage diseases. The role of cell pathology in the development of atherosclerosis. The cell as a system.	PT
	Topic 2.2. Disorders of local blood circulation. Mechanisms and manifestations of arterial hyperemia. Neurototic arterial hyperemia. Neuroparalytic arterial hyperemia. Humoral arterial hyperemia. Mechanisms and manifestations of venous hyperemia. Mechanisms and manifestations of ischemia. Outcomes of ischemia. Collateral blood circulation. Hemorrhages. Capillary stasis. The pathophysiology of hemostasis. Thrombosis. Physiological mechanisms of blood coagulation. The internal mechanism of thrombosis. Cellular hemostasis. The internal mechanism of blood coagulation. Plasma coagulation factors. The external mechanism of blood coagulation. Fibrinolysis. Anti-clotting system. The role of vascular endothelium in thrombosis. DIC-syndrome. Kinds microthrombosis in DIC syndrome. Embolisms and their role in the occurrence of pathological processes.	
	Topic 2.3. Inflammation. Dynamics of the acute inflammatory process. Primary and secondary alterations. Mediators and cytokines of the inflammatory response. Vascular reaction in case of inflammation. Physico-chemical changes in the focus of inflammation. Marginalization, adhesion, and diapedesis of leukocytes. Mechanisms of phagocytosis. Proliferation. Changes in metabolism in the focus of acute inflammation. The scheme of pathogenesis of acute inflammation. Outcomes of acute inflammation. Generalized inflammation. Blockade of the inflammatory focus. Pathogenic effects of inflammatory mediators and pro-inflammatory drugs on the body cytokines. Etiology and pathogenesis of generalized inflammation. Multiple organ failure and hypermetabolism syndrome. "Septic shock." Chronic inflammation.	PT

	<p>Topic 2.4. Immunity. Immunopathology.</p>	<p>Classification of immunity. Innate (nonspecific) immunity. Factors and systems of innate immunity. Cellular factors of innate immunity. Humoral factors of innate immunity. Acquired (adaptive) immunity. Factors and systems of acquired immunity. Cellular factors of acquired immunity. Maturation and differentiation of lymphocytes. Features of the functioning of various types of T-lymphocytes. Humoral factors of acquired immunity. Antibody formation. Mechanisms of formation of the immune response. The role of cytokines in the formation and implementation immune response. Neurohumoral regulation of immune processes. Pathology of immunity. Immunodeficiency conditions. Primary immunodeficiency. Secondary immunodeficiency. Etiology, pathogenesis and manifestations of HIV infection. Transplant immunity. The main histocompatibility complex. Mechanisms of graft rejection. The "host versus transplant" reaction. Immunological tolerance. The graft-versus-host reaction. The fetus is like a transplant.</p>	<p>PT</p>
	<p>Topic 2.5. Allergy.</p>	<p>Allergy and immunity. Classification of allergic conditions. Pathogenesis of the immune mechanisms underlying allergic reactions according to the classification of Jell and Coombs. The main types of allergic processes. Anaphylactic shock. Serum sickness. The phenomenon Artyus-Sakharov. The dynamics of an allergic reaction. Regulatory systems of the body and allergies. Auto-allergy. Primary and secondary autoallergens. Mechanisms of autoaggression. Primary and secondary autoallergic diseases.</p>	<p>PT</p>
	<p>Topic 2.6. Pathophysiology of tumor growth.</p>	<p>The concept of "Tumors". Classification of tumors. Etiology and pathogenesis of tumor growth. Physical, chemical and biological carcinogenesis. Atypia. Types of atypia. Precancerous conditions.</p>	<p>PT</p>

Module 3 Non-specific metabolic disorders	Topic 3.1. Hypoxia. The concept of "Hypoxia". Classification of hypoxic states. Etiology and pathogenesis of certain types of hypoxia. Decompression sickness. Altitude sickness. Mountain sickness. Mechanisms of adaptation to acute and chronic hypoxia.	PT
	Topic 3.2. Pathology of body thermoregulation. General mechanisms of thermoregulation. Etiology and pathogenesis of heat balance disorders. Hypothermia. Hyperthermia. Fever. Chemical hypothermia. Physical hypothermia (craniocerebral).	PT
	Topic 3.3. Pathophysiology of carbohydrate metabolism. Diabetes mellitus. Features of carbohydrate metabolism. Classification, etiology and pathogenesis of the main forms of diabetes mellitus. Manifestations of diabetes mellitus. Principles of pathogenetic therapy of diabetes mellitus. Pathogenesis of complications of diabetes mellitus.	PT
	Topic 3.4. Pathology of a water-salt exchange. Edema. Pathophysiology of acid-base balance. Disorders of water-salt metabolism. Changes in the total volume of water in the body. Etiology and pathogenesis of edema. The main types of edema. Pathophysiology of acid-base imbalances. Blood buffer systems. The role of kidneys in the regulation of ABB. The role of the gastrointestinal tract and liver in the regulation of ABB. The main parameters of the acid-base balance. Acidosis and alkalosis. Solving clinical tasks related to ABB disorders.	PT
	Topic 3.5. Integral mechanisms of metabolic disorders. General principles of metabolic regulation. Causes and mechanisms of disorders of systemic regulation. The main types of metabolic disorders of vitamins, minerals and trace elements.	PT
	Topic 3.6. Pathophysiology of lipid, protein and purine metabolism. Features of protein metabolism. Types of protein synthesis. Nutritional deficiency. Types of starvation. Pathophysiology of protein breakdown disorders in the body. Dysproteinosis. Pathology of fat metabolism. Etiology and pathogenesis of alimentary obesity. Principles of pathogenetic therapy of alimentary obesity. Secondary obesity. Dyslipidemia. Atherosclerosis. Familial hypercholesterolemia. Abetalipoproteinemia. Disorders of purine metabolism. The pathogenesis of gout.	PT
Module 4 Extreme states	Topic 4.1. Pathophysiology of extreme states. The concept of "Extreme conditions". The concept of "Terminal states". Etiology and pathogenesis of extreme and terminal conditions.	PT
	Topic 4.2. Stress. Pain. Shock. Collapse. Coma. Dying and revival of an organism. Apparent and natural death. Principles of resuscitation. The doctrine of stress. Pathophysiology of pain. Nociceptive systems. Mechanisms of peripheral and central sensitization. Features of individual pain syndromes. Shock. Types of shock. Etiology and pathogenesis of certain types of shock. Principles of antishock therapy. Collapse. The difference the shock of the collapse. A coma. Classification of comatose states. Dying and resuscitation. Clinical and	PT

	biological death. Principles of resuscitation.	
Module 5 “Diseases of civilization”	Topic 5.1. Chronopathology. The concept of "Diseases of civilization". Types of biorhythms. Regulation biorhythms. Pathophysiology of biorhythms. Desynchronoses. The mismatch between daily body patterns and real time as a result of transmeridian flights. Space flights. The consequences of prolonged sleep-wake rhythm mismatch during shift and night work. Changing the parameters of the current geophysical time sensors.	PT
	Topic 5.2. Ecological pathophysiology The concept of "Ecological pathophysiology". Causes of disruption of the natural connections between humans and their environment.	PT
Module 6 Pathophysiology of the hematopoietic system	Topic 6.1. Anemias. Hemoblobonosis. Hemoglobinopathies. Anemia. Classification of anemic conditions. Pathophysiology of certain types of anemia. Acute posthemorrhagic anemia. Chronic posthemorrhagic anemia. Deficiency anemia. Hemolytic anemia. The pathophysiology of hemoglobinosis. Genetics of hemoglobinosis. Sickle cell anemia. Thalassemia.	PT
	Topic 6.2. Leukocytosis. Leukopenia. Leukemias. Leukocytosis. Leukopenia. White blood cell count and its changes in pathologies. Agranulocytosis. Degenerative changes in leukocytes. Leukemias. Classification of leukemias. Etiology and pathogenesis of leukemia. The main causes of death in leukemia. Leukemoid reactions. Principles of pathogenetic therapy of leukemia.	PT
	Topic 6.3. Clinical tasks in the pathophysiology of the hematopoietic system. Analysis of clinical tasks in the pathology of the blood system. Control work.	PT
	Topic 6.4. Hemorrhagic diatheses. Hemorrhagic diathesis. Classification of hemorrhagic diatheses. Pathogenesis of certain types of hemorrhagic diatheses.	PT
Module 7 Pathophysiology of the cardiovascular and respiratory systems.	Topic 7.1. Mechanisms of cardiac dysfunction. Arrhythmias. Key Features ECG of arrhythmias. The concept and classification of arrhythmias. Electrophysiology of the heart and its disorders in arrhythmias. The algorithm of ECG analysis.	PT
	Topic 7.2. Ischemic heart disease. The concept and classification of ischemic heart disease. Etiology and pathogenesis of certain forms of ischemic heart disease. Non-coronary necrosis of the myocardium. Stages of development and complications of myocardial infarction.	PT
	Topic 7.3. Acute coronary syndrome. The concept of ACS. Etiology and pathogenesis of ACS. Pathogenesis of ischemic and reperfusion injuries of the myocardium. The concept of "New ischemic syndromes".	PT
	Topic 7.4. Heart defects. Cardiomyopathies. Myocarditis. Endocarditis. Pericarditis. Concepts and classifications of "Heart defects. Cardiomyopathy.	PT

	Myocarditis. Endocarditis. Pericarditis." Etiology and pathogenesis of certain types.	
	Topic 7.5. Heart failure. Pathophysiology of respiration. The concept and classification of heart failure. Etiology, pathogenesis and hemodynamic changes in heart failure. Nonspecific disorders of the respiratory system. Emphysema of the lungs. Pneumothorax. Acute respiratory failure. Chronic respiratory failure.	PT
	Topic 7.6. Pathophysiology of bronchial obstruction syndromes. The concept of bronchial obstruction. Classification, etiology and pathogenesis of forms of bronchoobstructive syndrome. Etiology and pathogenesis of bronchial asthma.	PT
	Topic 7.7. Pathophysiology of vascular tone. Acute vascular events. General mechanisms of vascular tone regulation. Hypertensive conditions. Hypotonic states. Essential and symptomatic hypertension. Pathogenesis hypertension. Clinical and morphological forms hypertension. Complications of hypertension.	PT
	Topic 7.8. Pathophysiology of the vascular wall. Atherosclerosis. The concept of atherosclerosis. Etiology and pathomorphogenesis of atherosclerosis. Outcomes of atherosclerosis and its significance in cardiovascular pathology. Clinical and morphological forms of atherosclerosis. Principles of atherosclerosis therapy.	PT
Module 8 Pathophysiology of the gastrointestinal tract	Topic 8.1. Non-specific dysfunctions of the gastrointestinal tract. Pathogenesis of nonspecific disorders of the digestive tract. Etiology and pathogenesis of acute gastritis. Etiology and pathogenesis of chronic gastritis.	PT
	Topic 8.2. Peptic ulcer disease of the stomach and duodenum. Diseases of the operated gastrointestinal tract. Intestinal obstruction. Etiology and pathogenesis of peptic ulcer disease of the stomach and duodenum. Pathogenesis of diseases of the "operated" stomach. Intestinal obstruction.	PT
	Topic 8.3. Pathophysiology of the liver and bile ducts. Pathophysiology of the pancreas. Liver functions. Metabolism of bile pigments. Pathogenesis of various types of jaundice. Non-specific disorders of liver functions. Cirrhosis of the liver. Acute and chronic liver failure. Liver coma. Pathophysiology of cholelithiasis. Disorders of pancreatic functions. Pancreatitis.	PT
Module 9 Pathophysiology of the excretory system	Topic 9.1. Non-specific disorders of the excretory function of the kidneys. Mechanisms of typical disorders of the excretory function of the kidneys. Nephrotic syndrome. Nephritic syndrome.	PT
	Topic 9.2. Certain forms of kidney pathology. Etiology and pathogenesis of acute and chronic diffuse glomerulonephritis. Pyelonephritis. Kidney stone disease. Acute and chronic renal failure. Uremia. Renal coma. Principles of pathogenetic therapy for kidney diseases.	PT
Module 10 Pathophysiology of the endocrine	Topic 10.1. General mechanisms of endocrine disorders. Pathophysiology of the hypothalamic, pituitary and adrenal systems. The main pathways of endocrine gland dysfunction. Mechanisms	PT

system	and manifestations of disorders of the hypothalamic-pituitary-adrenal system.	
	Topic 10.2. Pathophysiology of thyroid, parathyroid glands, thymus, epiphysis and gonads. Pathophysiology of thyroid dysfunction. Etiology, pathogenesis, and clinical manifestations of hyperthyroidism. Etiology, pathogenesis, and clinical manifestations of hypothyroidism. Pathophysiology of the gonads, thymus, and pineal gland.	PT
Module 11 Pathophysiology of the nervous system and higher nervous activity	Topic 11.1. Pathophysiology of functional neuroses. Pathophysiology of alcoholism and drug addiction. Pathophysiology of functional neuroses. Typical changes in nervous processes in neuroses. Somatic manifestations of neuroses. Pathological reflexes. Pathophysiology of alcoholism and drug addiction.	PT
	Topic 11.2. Pathophysiology of CNS. Electrophysiology and principles of hierarchical regulation of the CNS. Pathogenesis of individual CNS disorders. Pathophysiology of sleep disorders. Pathophysiology of memory disorders.	PT

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

6. COURSE EQUIPMENT AND TECHNOLOGY SUPPORT REQUIREMENTS

Table 6.1. classroom Equipment and Technology Support Requirements

Classroom for Academic Activity Type	Classroom Infrastructure	Specialized Classroom Equipment, software and materials
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 Optoma HD146x Screen Lumien Master Control LMC-100109 183x244 cm Matte White FiberGlass, with electric drive Universal ceiling mount Vogel"s PPC 130 for projectors SPARK system unit assembled DP-12bd rotary board

Classroom for Academic Activity Type	Classroom Infrastructure	Specialized Classroom Equipment, software and materials
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)	ViewSonic PA503S projector + Digis DSM-2 ceiling mount + Peerless ceiling rod 61-91 cm with cable channel Projecta Elpro Electrol 200x200cm Matte White S screen with 1:1 electric drive SPARK system unit + Microsoft software (OS, office suite, including MS Office/Office 365)
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 Projector PA503S + Digis DSM-2 Ceiling Mount Ceiling Bracket SPARK System Unit Assembled Lumien Screen Master Control LMC 100109 183x244 cm Matte White Fiberglass, with motorized operation 3-Element Whiteboard Combined Chalkboard Magnetic Marker 360x120 All-in-One PC SafeRay S2410G3R: 23.8"/FHD/4epHbm / H610 Thin Mini-ITX / Core i5 12400/DDR4 16GB/SSD 512GB M.2 (10 pcs.) Software: Microsoft products (OS, office suite, including MS Office/Office 365, Teams, Skype)
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	ViewSonic PA503S projector + Digis DSM-2 ceiling mount + Peerless ceiling rod 61-91 cm with cable channel Projecta Elpro Electrol 200x200cm

Classroom for Academic Activity Type	Classroom Infrastructure	Specialized Classroom Equipment, software and materials
	includes portable multimedia projector, laptop, projection screen, stable wireless Internet connection. (room: 212)	Matte White S screen with 1:1 electric drive SPARK system unit + Microsoft software (OS, office suite, including MS Office/Office 365)

7. RESOURCES RECOMMENDED FOR COURSE

a) Main readings:

1. Blagonravov M.L., Sklifasovskaya A.P. General pathophysiology. Textbook. - Moscow : PFUR, 2025. - 281 p. : ISBN 978-5-209-12668-3
https://mega.rudn.ru:443/MegaPro/UserEntry?Action=Rudn_FindDoc&id=526156&idb=0
2. Blagonravov M.L., Sklifasovskaya A.P. Clinical pathophysiology. Textbook. - Moscow : PFUR, 2025. - 290 p. : ISBN 978-5-209-12667-6
https://mega.rudn.ru:443/MegaPro/UserEntry?Action=Rudn_FindDoc&id=526157&idb=0
3. 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.
4. Ходорович Н.А., Величко Э.В. Патофизиология нарушений кислотно-основного состояния: алгоритм и примеры решения клинических задач = Acid-Base Disorders: Algorithm and Case Studies ; учебно-методическое пособие. — Книга на английском языке. — Москва: РУДН, 2021. — 35 с. — ISBN 978-5-209-10332-5: 64.51
https://mega.rudn.ru/MegaPro/UserEntry?Action=Link_FindDoc&id=495172&idb=0

b) Additional readings:

1. Благодравов М.Л., Склифасовская А.П. Патофизиология иммунной системы = Pathophysiology of the immune system : учебно-методическое пособие. - Москва : РУДН, 2020. - 23 с. — Книга на английском языке. ISBN: 978-5-209-10443-8
https://mega.rudn.ru/MegaPro/UserEntry?Action=Link_FindDoc&id=497587&idb=0
2. Благодравов М.Л., Склифасовская А.П. Патофизиология жирового и белкового обмена = Pathophysiology of lipid and protein metabolism : учебно-методическое пособие. — Москва : РУДН, 2020. — 17 с. — Книга на английском языке. ISBN 978-5-209-10589-3
https://mega.rudn.ru/MegaPro/UserEntry?Action=Link_FindDoc&id=497588&idb=0
3. 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>
4. Mohan Harsh. Textbook of pathology. - New Delhi : Jaypee Brothers Medical Publishers Ltd., 2015. - 7 th ed. - 954 p.: il
5. Mohan Harsh. Textbook of pathology. - New Delhi : Jaypee Brothers Medical Publishers Ltd., 2015. - 7 th ed. - 665 p.: il. Supplement

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

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/>

Educational and methodological materials for self-studies of students in the development of the discipline/module:*

1. *A course of lectures on the discipline "Pathophysiology, clinical pathophysiology".*

2. *Guidelines for the implementation of tests in the discipline "Pathophysiology, clinical pathophysiology"*

** - all educational and methodological materials for independent work of students are placed in accordance with the current procedure on the page of the discipline in ESYSTEM!*

8. ASSESSMENT AND EVALUATION TOOLKIT AND ASSESSMENT & GRADING SYSTEM

Assessment and Evaluation Toolkit and Assessment & Grading System* for assessing the level of competence formation based on the results of mastering the discipline «Pathophysiology, clinical pathophysiology» are presented in the Appendix to this Work Program of the discipline.

* - Assessment and Evaluation Toolkit and Assessment & Grading System are formed on the basis of the requirements of the relevant local normative act of the RUDN University.

DEVELOPERS:

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

M.L. Blagonravov

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

signature

V.A. Goryachev

Name of the developer

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

signature

M.L. Blagonravov

Name of Head of Department

Head of Program

signature

N.V. Sturov

Name of head of program