

Federal State Autonomic Educational Institution of Higher Education  
«Peoples' Friendship University of Russia»

*Medical Institute*

Recommended MCSD

**SYLLABUS**  
(STUDY GUIDE)

**Subject**

**Pathophysiology, Clinical Pathophysiology**

**Recommended for the direction of training (specialty)**

**31.05.01 General Medicine**

**Program (profile, specialization)**

**General Medicine**

**1. Aims and objectives of discipline:** assistance trained in studying of the reasons, mechanisms of development and outcomes of standard pathological processes and diseases of separate bodies and systems which basis they make.

Problems of discipline:

- 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. Place of discipline in the structure of OP HE:**

Discipline “Pathophysiology, clinical pathophysiology” refers to the basic part of Block 1 of the curriculum.

The preceding and following disciplines directed to formation of competences of discipline according to a matrix of competences of OP HE are given in the table № 1.

Table 1.

**Preceding and following the discipline aimed at creating competencies**

№	Code and name of competence	The previous disciplines	The subsequent disciplines (groups of disciplines)
Universal Competences (UC)			
1	UC-1	Philosophy, Psychology and Pedagogy, Physics, Mathematics, Biochemistry, Anatomy, Immunology, Introduction to Nutrition	Hygiene, Internal Medicine Propedeutics, Public Health and Health Care, Health Economics, Epidemiology, Neurology, medical genetics, neurosurgery, Disaster medicine, Faculty therapy, Hospital therapy, Endocrinology, Infectious diseases, Phthisiology, Medical elementology, Allergology
General professional competences (GPC)			
2	GPC-5	Psychology and Pedagogy, Biochemistry, Biology, Anatomy, Histology, Embryology, Cytology, Normal Physiology, Microbiology, Virology, Molecular Genetics in Practical Biology and Medicine, Molecular	Propedeutics of internal diseases, General surgery, Topographic anatomy and operative surgery, Dermatovenereology, Neurology, medical genetics, neurosurgery, Ophthalmology, Forensic medicine, Faculty therapy, Faculty surgery, Occupational diseases,

		Physiology	Hospital therapy, Anesthesiology, resuscitation, surgery, intensive care, Hospital surgery, Oncology, radiation therapy, Maxillofacial surgery, Medical elementology
Professional competences (type of professional activity (PC))			
3	PC-2	Physics	Propedeutics of internal diseases, Radiology diagnostics, General surgery, Dermatovenereology, Neurology, medical genetics, neurosurgery, Psychiatry, medical psychology, Otorhinolaryngology, Ophthalmology, Faculty therapy, Faculty surgery, Urology, Occupational retention therapy, Hospital therapy, Endocrinology , intensive care, Hospital surgery, pediatric surgery, Dentistry, Oncology, radiation therapy, Traumatology, orthopedics, Pediatrics, Oral and maxillofacial surgery, Sectional course, Medical elementology, Reproductive health, Endoscopic urology, Topical issues of neonatology, Fundamentals of pediatric nutrition

**3. Requirements to results of development of discipline:** The process of studying the discipline is aimed at the formation of the following competencies:

Table 2.

**Formed competencies**

Competence Category	Code and Name	Achievement Indicator Code and Name
UC-1.	Being able to implement critical analysis of problem situations based on systems approach, develop an action strategy	UC-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	GPC-5.1. Mastering the algorithm of clinical, laboratory and functional diagnosis when

	processes in the human body to solve professional tasks	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).

As a result of study of discipline a student must:

**Know:** Structure, topography and development of cages, fabrics, bodies and systems of an organism in interaction with their function in norm and pathology, feature of organismal, population levels of the organization of life;  
Concepts of an etiology, pathogenesis, morphogenesis of an illness, nosology, principles of classification of diseases basic concepts of the general nosology;  
Concepts of functional systems of a human body, their regulation and self-control at interaction with environment in norm and pathology;  
Structural and functional bases of diseases and pathological processes, reasons, main mechanisms of development and outcomes of standard pathological processes, disorders of functions of bodies and systems;  
Structure and functions of immune system of the person, its age features, cellular and molecular mechanisms of development and functioning of immune system, main stages, types, genetic control of the immune answer, immunodiagnosics methods.

**Be handy at:** To use educational, scientific, popular scientific literature, the Internet for professional activity;  
To explain character of deviations in process which can lead to formation of options of anomalies and defects;  
To interpret results of the most widespread methods of functional diagnostics applied to diagnosis of pathology of blood, heart, vessels, lungs, kidneys, a liver and other bodies and systems;  
To define and estimate results of an electrocardiography, the spirometry, thermometry, hematologic indicators;  
To distinguish in blood serum normal values of levels of metabolites (glucose, urea, bilirubin, uric acid, dairy and pyruvic acids, etc.) from pathological changed, to read a protein electrophoresis and to explain the reasons of distinctions;  
To treat data the enzymological of researches of serum of blood;  
To analyze questions of the general pathology both modern theoretical concepts and the directions in medicine;  
To prove the principles of pathogenic therapy of the most widespread diseases.

**Manage:**

Skills of statement of the preliminary diagnosis on the basis of results of biochemical researches of biological liquids of the person.  
Skills of comparison of morphological and clinical manifestations of an illness.

#### 4. Volume of discipline and types of study

General credit value of the discipline is 8 credit units.

The general labor input of discipline makes 8 points of credit (p.s.).

Type of study load	Total hours	Semesters			
		5	6		
<b>Class hours (All)</b>	180	90	90		
Include:	-	-	-	-	-
<i>Lectures (L)</i>	36	18	18		
<i>Practical trainings (PT)</i>					
<i>Seminars (S)</i>					
<i>Laboratory research (LR)</i>	144	72	72		
<b>Independent work (total)</b>	108	54	54		
<b>Total labor input, hours</b>	288	144	144		
<b>Credit units.</b>	8	4	4		

#### 5. Content of the discipline

##### 5.1. The content of the discipline sections

№	Name of the section of discipline	Contents of the section
1.	General nosology. Ecological pathophysiology	Conceptions of health and disease. Sano- и pathogenesis. “Diseases of civilization”. Chronopathology.
2.	Cellular pathology	Pathology of cellular biomembranes and organells. Types and mechanisms of cell death. Disorders of biorhythms of a cell.
3.	Non-specific pathological processes	Disorders of local blood circulation. Inflammation. Immunity. Immunopathology. Allergy. Pathophysiology of tumor growth. Hypoxia.
4.	Non-specific metabolic disorders	Pathology of body thermoregulation. Pathology of a water-salt exchange. Pathophysiology of acid-base balance. Pathophysiology of carbohydrate metabolism. Pathophysiology of lipid, protein and purine metabolism.
5.	Extreme states	Pathophysiology of pain. Stress. Shock. Collapse. Coma. Dying and revival of an organism. Apparent and natural death. Principles of resuscitation.
6.	Pathophysiology of the hematopoietic system	Anemias. Hemoblobonosis. Hemoglobinopathies. Leukocytosis. Leukopenia. Leukemias. Hemorrhagic diatheses.
7.	Pathophysiology of the cardiovascular system	Arrhythmias. Coronary heart disease. Coronarogenic and noncoronarogenic necrosis of the myocardium. Complications of myocardial infarction. Heart diseases. Cardiomyopathies. Myocarditis. Endocarditis. Pericarditis. Heart failure. Pathophysiology of vascular tonus. Pathophysiology of the vascular wall. Atherosclerosis.
8.	Pathophysiology of the	Nonspecific dysfunction of external breath. Respiratory

	respiratory system	failure. Asphyxia. Emphysema of the lungs. Pulmonary oedema. Bronchial asthma. Pneumothorax.
9.	Pathophysiology of the gastrointestinal tract	Non-specific dysfunctions of the gastrointestinal tract. Acute and chronic gastritis. Peptic ulcer. Diseases of the operated GIT. Pathophysiology of the liver and bile ducts. Jaundice. Hepatic failure. Pathophysiology of cholecystitis. Pathophysiology of the pancreas. Intestinal obstruction.
10.	Pathophysiology of the excretory system	Non-specific disorders of the excretory function of the kidneys. Nephrotic syndrome. Nephritic syndrome. Acute and chronic diffuse glomerulonephritis. Pyelonephritis. Urolithiasis. Acute and chronic renal failure. Uremia. Renal coma.
11.	Pathophysiology of the endocrine system	General mechanisms of endocrine disorders. Pathophysiology of the hypothalamic, pituitary and adrenal systems. Pathophysiology of thyroid, parathyroid glands, thymus, epiphysis and gonads.
12.	Pathophysiology of the nervous system and higher nervous activity	Pathophysiology of functional neuroses. Pathological reflexes. Pathophysiology of sleep disorders. Pathophysiology of amnesia. Pathophysiology of drug addiction. Pathophysiology of alcoholism.

## 5.2. Sections of disciplines and types of classes

№	Name of the section of discipline	L	PC	LR	S	Ssgw	Total hours
1.	General nosology. Ecological pathophysiology.	6		10		8	24
2.	Cellular pathology			5		4	9
3.	Non-specific pathological processes	8		28		20	56
4.	Non-specific metabolic disorders	2		24		18	44
5.	Extreme states	2		5		4	11
6.	Pathophysiology of the hematopoietic	2		10		8	20
7.	Pathophysiology of the cardiovascular system	6		30		20	56
8.	Pathophysiology of the respiratory system	2		2		2	6
9.	Pathophysiology of the gastrointestinal tract	2		10		8	20
10.	Pathophysiology of the excretory system	2		4		4	10
11.	Pathophysiology of the endocrine system	2		10		8	20
12.	Pathophysiology of the nervous system	2		6		4	12

	and higher nervous activity						
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## 6. Laboratory training (not intended)

## 7. Practical training (seminars) (if available)

№	№ of the section of discipline	Subject of a practical training (seminars)	Workload (hours)
1.	General nosology. Ecological pathophysiology.	Conceptions of health and disease. Sano- и pathogenesis. Diseases of “civilization”. Chronopathology.	10
2.	Cellular pathology	Pathology of cell biomembranes and organells. Types and mechanisms of cell death. Disorders of biorhythms of a cell.	5
3.	Non-specific pathological processes	Disorders of local blood circulation. Inflammation. Immunity. Immunopathology. Allergy. Pathophysiology of tumor growth. Hypoxia.	28
4.	Non-specific metabolic disorders	Pathology of body thermoregulation. Pathology of a water-salt exchange. Oedema. Pathophysiology of acid-base balance. Pathophysiology of carbohydrate metabolism. Pathophysiology of lipid, protein and purine metabolism.	24
5.	Extreme states	Pathophysiology of pain. Stress. Shock. Collapse. Coma. Dying and revival of an organism. Apparent and natural death death. Principles of resuscitation.	5
6.	Pathophysiology of the hematopoietic system	Anemia. Hemoblobonosis. Hemoglobinopathies. Leukocytosis. Leukopenia. Leukemias. Hemorrhagic diatheses.	10
7.	Pathophysiology of the cardio-vascular system	Arrhythmias. Coronary heart disease. Coronarogenic and noncoronarogenic necrosis of the myocardium. Complications of a myocardial infarction. Heart diseases. Cardiomyopathies. Myocarditis. Endocarditis. Pericarditis. Heart failure. Pathophysiology of vascular tonus. Pathophysiology of the vascular wall. Atherosclerosis.	30
8.	Pathophysiology of the respiratory system	Nonspecific dysfunction of external breath. Respiratory failure. Asphyxia. Emphysema of the lungs. Pulmonary oedema. Bronchial asthma. Pneumothorax.	2
9.	Pathophysiology of the gastrointestinal tract	Non-specific dysfunctions of the gastrointestinal tract. Acute and chronic gastritis. Peptic ulcer. Diseases of the operated GIT. Pathophysiology of the liver and bile ducts. Jaundice. Hepatic failure. Pathophysiology of cholecystitis. Pathophysiology of the pancreas. Intestinal obstruction.	10
10.	Pathophysiology of the excretory system	Non-specific disorders of the excretory function of the kidneys. Nephrotic syndrome. Nephritic syndrome. Acute and chronic diffuse glomerulonephritis. Pyelonephritis. Urolithiasis. Acute and chronic renal failure. Uremia. Renal coma.	4
11.	Pathophysiology	General mechanisms of endocrine disorders.	10

	of the endocrine system	Pathophysiology of the hypothalamic, pituitary and adrenal systems. Pathophysiology of thyroid, parathyroid glands, thymus, epiphysis and gonads.	
12.	Pathophysiology of the nervous system and higher nervous activity	Pathophysiology of functional neuroses. Pathological reflexes. Pathophysiology of sleep disorders. Pathophysiology of amnesia. Pathophysiology of drug addiction. Pathophysiology of alcoholism.	6

## 8. Material and technical support of the discipline:

Computers and projectors for demonstration of slides – 3 sets.

Computer class for control testing and independent work of students on the Internet – 10 computers.

Light microscope “Nikon Eclipse E400” with a video system and a computer (Japan)

Holter monitoring system “Schiller” (Switzerland)

System of radio-telemetric monitoring “DSi” (USA)

System for capillary electrophoresis “Kapell-105M” (Russia)

Electronic scales “Pioneer”

Homogeniser “WiseTis”

## 9. Information support of the discipline:

### a) Software:

Volume Licensing Program (Microsoft Subscription) Enrollment for Education Solutions (EES) No. 56278518 dated 04/23/2019 (renewed annually, the program is assigned a new number).

Chronos-Fit program (P. Zuther, S. Gorbey and B. Lemmer, 2009).

### b) Databases, reference and search systems:

ELS RUDN University and third-party ELS, to which students have access on the basis of concluded agreements:

- Electronic library system RUDN - ELS RUDN <http://lib.rudn.ru/MegaPro/Web>
- ELS "University Library Online" <http://www.biblioclub.ru>
- ELS Yurayt <http://www.biblio-online.ru>
- ELS "Student Consultant" [www.studentlibrary.ru](http://www.studentlibrary.ru)
- ESYSTEM: <http://esystem.pfur.ru/course/view.php?id=46>

### c) Database of medical and biological publications:

- NCBI: <https://p.360pubmed.com/pubmed/>
- Vestnik RUDN: access mode from the RUDN University territory and remotely <http://journals.rudn.ru/>
- Scientific library Elibrary.ru: access by IP-addresses of RUDN University at: <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 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/>



- Scopus - scientometric database of the publishing house "Elsevier". There is remote access to the database.

Access by IP-addresses of RUDN University and remotely by login and password (Grant of the Ministry of Education and Science). Access mode: <http://www.scopus.com/>

- 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/>

## **10. Educational and methodical support of the discipline:**

### **a) Main literature**

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

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

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

### **b) Additional literature:**

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](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.

## **11. Guidelines for students on the development of the discipline (module)**

In practical classes in the classroom, topics are analyzed using multimedia technology (computer, projector). For each classroom session and lecture, presentations prepared in Microsoft PowerPoint program are intended, containing from 30 to 60 slides. The main goal of the practical training is to study the causes of the onset, the foundations of the pathogenesis and outcomes of typical pathological and diseases of individual organs and systems.

For every practical equipment:

- topic and questions for study;
- a specific skill and skills that the student must master;
- control questions and tasks that determine the success of the assimilation of the studied material;
- questions for self-examination and assignments for independent work on topics in methodological developments for each section and posted on the ESYSTEM platform:

<http://esystem.pfur.ru/>

Detailed information, including theoretical material, a glossary and a list of recommended literature for students wishing to get acquainted with the topic under study in more detail, can be found on the ESYSTEM platform: <http://esystem.pfur.ru>.

The passage of each section ends with a midterm knowledge control in the form of computer testing (colloquium). In the process of midterm control, the student must show his knowledge and skills on the topic covered.

In the process of mastering the discipline in independent work, the student works with literature in the RUDN University library and uses the resources of the information and communication network "Internet".

The study of the discipline "Pathophysiology, clinical pathophysiology" ends with the passing of an exam - this is the final control. The exam is taken by teachers of the Department of General Pathology and Pathological Physiology named after V.A. Frolov and takes place in the form of an oral interview.

Questions for the exam are posted on the ESYSTEM platform: <http://esystem.pfur.ru/>

## **12. Fund of estimating means for the interim assessment of students in the discipline «Pathophysiology, clinical pathophysiology»**

Materials for assessing the level of mastering the educational material of the discipline "Pathophysiology, clinical pathophysiology", including a list of competencies with an indication of the stages of their formation, a description of indicators and criteria for assessing competencies at various stages of their formation, a description of assessment scales, standard control tasks or other materials required for the assessment of knowledge, abilities, skills and (or) experience of activities that characterize the stages of the formation of competencies in the process of mastering the educational program, methodological materials defining the procedures for assessing knowledge, skills, proficiencies and (or) experience of activities that characterize the stages of formation of competencies are developed in full volume and are available for students on the discipline page at the ESYSTEM RUDN.

The program is compiled in accordance with the requirements of the FSES HE.

### **Developer:**

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