Federal State Budget Educational Institution
of Higher Education
Pacific State Medical University
of the Ministry of Health of the Russian Federation

APPROVED BY
First Vice-Rector
_____ / Trankovskaya L.V./
"9" июня 2025

DISCIPLINE WORK PROGRAM

Б1.О.47 Fundamentals of functional diagnostics

(name of discipline)

Specialty	**31.05.01 General Medicine for international students (in English)** (code, name)
Degree	Specialist's degree
Profile	02 "Healthcare" (in the field of providing primary health care to the population in medical organizations: polyclinics, outpatient clinics, inpatient/outpatient facilities of the municipal health care system)
Mode of study	Full-time
Period of mastering the BEP	**6 years** (nominal length of study)
Institute	of Simulation and Training Technology

Vladivostok, 2025

Program of the discipline **Б1.О.47 Fundamentals of functional diagnostics** is based on:
1) Federal State Educational Standard of Higher Education for the specialty approved by the Order No. 988 of Ministry of Science and Higher Education of the Russian Federation dated August 12, 2020.

2) Curriculum for the 31.05.01 General Medicine for international students (in English), profile 02 "Healthcare" (in the field of providing primary health care to the population in medical organizations: polyclinics, outpatient clinics, inpatient/outpatient facilities of the municipal health care system), approved by the Academic Council of FSBEI HE PSMU of the Ministry of Health of Russia, Report No. 8/24-25 dated March 31, 2025.

Work program for the discipline was developed by the writing team of the Institute of Simulation and Training Technology of the FSBEI HE PSMU of the Ministry of Health of Russia, under the guidance of the head of the department, Gnezdilov V.V.

Developed by:

Director of the Institute		Gnezdilov V.V.
(position held)	(academic degree, academic title)	(full name)
Professor	Doctor of Medical Sciences, Associate professor	Solyanik E.V.
(position held)	(academic degree, academic title)	(full name)
Assistant professor	Candidate of Medical Sciences	Maystrovskaya Yu.V.
(position held)	(academic degree, academic title)	(full name)

1. GENERAL PROVISIONS

1.1. Purpose and Objectives of Mastering Б1.О.47 Fundamentals of functional diagnostics

The purpose of mastering the discipline is to acquire knowledge on the significance of the additional examination methods, methods of functional diagnostics in particular, in patient examination; examine changes in the examination results of patients with the most common diseases of the internal organs, their pathogenesis and diagnostic significance; learn to analyse examination results in order to make a diagnosis.

Objectives of mastering the discipline:

1. Acquiring basic knowledge of the diagnostic significance of the functional diagnostics methods, the range of the methods of functional diagnostics necessary to specify the diagnosis of the most common diseases of the internal organs;
2. Developing skills of determining the necessary additional examination methods, diagnostic analysis of the results taking into account aspects of receiving them in patients with diseases of internal organs.

2. DISCIPLINE AS PART OF THE BASIC EDUCATIONAL PROGRAM

Discipline **Б1.О.47 Fundamentals of functional diagnostics** is included in the Mandatory part of the Unit 1 of the basic educational program for the specialty 31.05.01 General Medicine for international students (in English), profile 02 "Healthcare" (in the field of providing primary health care to the population in medical organizations: polyclinics, outpatient clinics, inpatient/outpatient facilities of the municipal health care system), and is part of the 5th and 6th semesters' curriculum

3. PLANNED LEARNING OUTCOMES OF THE DISCIPLINE

3.1. Mastering the discipline **Б1.О.47 Fundamentals of functional diagnostics** is aimed at the development of students' competencies. The discipline facilitates the development of students' competencies corresponding to the types of professional activity.

Name of competency category (group) / Labor function	**Code and Name of competency of the graduate**	**Competency Indicators**
General Professional Competencies		
Instrumental Diagnostics	GPC-4. Is able to use medical devices included in the healthcare guidelines, as well as perform medical examination to make a diagnosis	CI.GPC-4_1- uses medical devices for diagnosis, treatment and rehabilitation in accordance with healthcare guidelines CI.GPC-4_2- performs medical examination of a patient using basic and general clinical skills, laboratory tests and diagnostic procedures CI.GPC-4_3- evaluates medical examination results in order to make a diagnosis
Etiology and pathogenesis	GPC-5. Is able to assess morphofunctional status, physiological states, and pathological processes in the human body when working to achieve objectives of professional activity	CI.GPC-5_1- assesses the morphofunctional state based on the acquired knowledge CI.GPC-5_2- distinguishes between pathological and physiological processes, identifies etiology of changes CI.GPC-5_3- provides diagnostic assessment of the identified changes
Professional Competencies		
A/02.7 Examination of the patient in order to make a diagnosis	PC-3 Ability and readiness to collect and analyze complaints that a patient presents with, anamnestic data, examination results, results of laboratory and	CI.PC-3_1- collects patient's anamnesis, conducts examination, palpation, percussion and auscultation in healthy people with noninfectious and infectious diseases of internal organs, provides a diagnostic assessment of the identified symptoms,

	instrumental tests, biopsy and other studies in order to identify patient's condition or establish the presence or absence of a disease	diagnoses syndromes; CI.PC-3_2- identifies pathogenetic and pathomorphological features of diseases of internal organs; CI.PC-3_3- selects required additional diagnostic methods, evaluates their results in order to recognize patient's condition, establish the presence or absence of the disease

3.2. Types of professional activity corresponding to competencies developed over the course of mastering **Б1.О.47 Fundamentals of functional diagnostics**:

Types of professional activity objectives

1. Medical

Kinds of professional activity objectives

1. Diagnostics

3.3. Planned learning outcomes of mastering the discipline are represented by knowledge, skills, abilities and/or experience, characterize the stages of developing competencies and ensure achievement of the planned outcomes of mastering the basic educational program. Learning outcomes of a discipline are correlated with competency indicators.

4. SCOPE AND CONTENT OF THE DISCIPLINE

4.1. Scope of the Discipline and Types of Academic Work

Type of Academic Work		**Total Hours**	**Semesters**	
			5	**6**
			hours	**hours**
1		2	3	4
Classroom hours (total), including:		**48**	**24**	**24**
Lectures (L)		16	8	8
Practical classes (C)		32	16	16
Independent work of the student (IW), including:		**24**	**12**	**12**
Preparing for classes (CP)		10	4	4
Preparing for continuous assessment (CAP)		10	4	4
Preparation for interim assessment (IAP)		4	2	2
Interim assessment				
Type of interim assessment	pass/fail test (T)	T		T
	exam (E)			
TOTAL: TOTAL credit value	hrs.	**72**	**36**	**36**
	credits	**2**	**1**	**1**

4.2. Contents of the Discipline

4.2.1. Topics of Discipline Lectures and Academic Hours per Semester

No.	Lecture Topic	Hours
1	2	3
	Semester No. 5	
1.	Functional diagnostics of respiratory diseases. Respiratory failure syndrome. Pulse oximetry, peak flow measurement, diagnostic value	2
2.	Functional diagnostics of respiratory diseases. Spirometry, diagnostic value of parameters. Concept of body plethysmography, diagnostic value	2
3.	Functional diagnostics of cardiovascular diseases. Diagnostic value of ECG, ECG diagnostics of cardiac rhythm and conduction disorders	2
4.	Functional diagnostics of cardiovascular diseases. Diagnostic value of echocardiography, 24-hour heart rate and arterial blood pressure monitoring, diagnostic value of functional methods	2
	Hours per semester total	**8**
	Semester No. 6	
1.	Functional diagnostics of gastrointestinal tract diseases. Gastric juice analysis and diagnostic value. Endoscopic diagnostic methods for functional gastrointestinal disorders. Radiographic and combined imaging methods for functional gastrointestinal disorders	2
2.	Functional diagnostics of liver and biliary tract diseases. Investigative duodenal intubation, stages, diagnostic value. Biochemical syndromes in liver dysfunction, evaluation of results, diagnostic value	2
3.	Functional diagnostics of renal system diseases. Urine analysis: assessment of physical properties, chemical examination, microscopical examination. Renal failure	2
4.	Functional diagnostics of hematology diseases. Clinical blood analysis, normal values, changes in the cellular composition of blood in functional disorders of the blood system	2
	Hours per semester total	**8**

4.2.2. Topics of Discipline Practical Classes and Academic Hours per Semester

No.	Practical Class Topic	Hours
1	2	3
	Semester No. 5	
1	Spirometry, indications for functional testing. Diagnostic value of predicted and actual values of spirometry parameters. Practical training - spirogram. Evaluation of results	4
2	Spirometry in patients with respiratory diseases. Analysis of spirograms in patients with respiratory diseases. Practical training - descriptive cases, situational cases (mini-cases). Laboratory tests in patients with respiratory system diseases	4
3	The importance of ECG in the diagnosis of functional disorders. Indications for echocardiography. Arterial blood pressure and 24-hour heart rate monitoring, parameters, results evaluation, diagnostic value	4
4	ECG analysis for rhythm and conduction disorders. Evaluation of ECG results in the diagnosis of cardiovascular diseases. Laboratory tests in cardiovascular system diseases	4
	Hours per semester total	**16**
	Semester No. 6	

1	Methods for diagnosing functional gastrointestinal disorders. Evaluation of endoscopic examination and imaging techniques results in the diagnosis of gastrointestinal diseases. Practical training – case studies (mini-cases)	4
2	Functional diagnostic methods for liver and biliary tract diseases. Evaluation of additional diagnostic methods for liver diseases. Practical training – case studies (mini-cases)	4
3	Functional diagnostic methods for renal diseases. Evaluation of additional diagnostic methods for renal diseases. Practical training – case studies (mini-cases)	4
4	Clinical blood analysis in the diagnosis of internal organ and blood system diseases, evaluation of results, and diagnostic value. Practical training – case studies (mini-cases)	4
	Hours per semester total	**16**

4.2.3. Independent Work of the Student

No.	Name of the Discipline Section	Type of IW	Total Hours
1	3	4	5
	Semester No. 5		
1	Functional diagnostics of respiratory diseases	Preparing for practical classes; preparing for tests and assignments	4
2	Functional diagnostics of cardiovascular system diseases	Preparing for practical classes; preparing for tests and assignments	4
3	Laboratory tests in patients with respiratory system and cardiovascular system diseases	Preparing for tests, preparing slides presentations	2
	Hours per semester total		**10**
	Semester No. 6		
1	Functional diagnostics of disorders of gastrointestinal tract, the liver, and biliary tract	Preparing for tests, preparing slides presentations	4
2	Functional diagnostics of renal diseases	Preparing for tests, preparing slides presentations	4
3	Clinical blood analysis in the diagnosis of internal organ and hematology system diseases	Preparing for tests, preparing slides presentations	2
	Hours per semester total		**10**

5. REQUIREMENTS FOR IMPLEMENTATION OF DISCIPLINE

5.1. Discipline Requirements for Educational Materials and Provided Information

Essential reading

No.	Name/Title, Resource Type	Author(s)/Editor	Publisher Imprint, Web Address	Number of Copies (accesses) in the Library and Information Center
1	**2**	**3**	**4**	**5**
1	Internal diseases propaedeutics [Electronic resource] / 2. - M.:	Ivashkin V.T., Okhlobystin A.V.	GEOTAR-Media, 2014. - http://www.studmedlib.ru/book/ ISBN97859704303 78.html	Unlimited access

2	Diagnostic radiology, and therapy	Ternova S.K., Sinitsyn V.E.	GEOTAR-Media, 2010. http://www.studmedlib.ru/book/ ISBN97859704139 20.html	Unlimited access
3	Clinical pathophysiology of the heart. Basics of electrocardiography (ECG). Normal ECG. Determination of the electrical axis of the heart (EAH)	Shchukin Yu.V., Surkova E.A., Dyachkov V.A.	M. : GEOTARMedia, 2012. http://www.studmedlib.ru/book/ 06- COS-2340.html	Unlimited access
4	Pathophysiology. Concise Lectures, Tests, Clinical-Pathophysiological Situations and Clinical Laboratory Cases [Electronic resource]: Student Manual	Litvitsky P., Pirozhkov S., Tezikov E.	M.: GEOTAR-Media, 2016. - http://www.studmedlib.ru/book/ ISBN9785970436004.html	Unlimited access

Supplementary reading

No.	**Name/Title, Resource Type**	**Author(s)/Editor**	**Publisher Imprint, Web Address**	**Number of Copies (accesses) in the Library and Information Center**
1	**2**	**3**	**4**	**5**
1	"Fundamentals of functional diagnostics of the cardiovascular, respiratory and nervous systems"	Salikhova Ye.Yu	https:/fundamentals-of-functional-diagnostics-of-the-cardiovascular-respiratory-and-nervous-systems-ucebnoe-posobie-salikhova-yeyu.html	Unlimited access
2	Macleod's clinical examination	Graham Douglas	https://books.google.ru	Unlimited access
3	ECG in arrhythmia: an atlas	Kolpakov E.V., Lyusov V.A., Volov N.A.	M.: GEOTAR-Media, 2013. http://www.studmedlib.ru/book/ ISBN9785970426036.html	Unlimited access

Online resources

1. Electronic library system "Student Consultant" http://studmedlib.ru/
2. Electronic library system "University Library Online"http://www.biblioclub.ru/
3. Electronic library system "Urait" https://urait.ru/
4. Electronic library system "BookUp" https://www.books-up.ru/
5. Resources owned by the Library and Information Center of FSBEI HE PSMU of the Ministry of Health of Russia https://tgmu.ru/university/bibliotechno-informacionnyj-centr/resursy-bic/sobstvennye/

Online resources and respective user guides are available on the Library and Information Center website Library and Information Center — PSMU (tgmu.ru)

5.2. Discipline Requirements for Facilities and Resources

Information on the facility and resource availability and requirements of the discipline is available on the Facility and resource availability and requirements. FSBEI HE PSMU of the Ministry of Health of Russia (tgmu.ru)" page of the official website of the university.

5.3. List of Information Technologies, Information and Reference Systems, Licensed and Free Software (Including Domestically-developed Software):

1. PolycomTelepresence M100 Desktop Conferencing Application (Videoconference system)
2. SunRav Software tTester
3. 7-PDF Split & Merge
4. ABBYYFineReader
5. Kaspersky Endpoint Security
6. INDIGO online testing system
7. Microsoft Windows 7
8. Microsoft Office Pro Plus 2013
9. 1C:University
10. GARANT system
11. MOODLE (Modular Object-Oriented Dynamic Learning Environment)

6. ASPECTS OF THE IMPLEMENTATION OF THE DISCIPLINE FOR STUDENTS WITH DISABILITIES AND SPECIAL NEEDS

6.1. Availability of Accessible Environment

For students with disabilities and special needs, if a written application is submitted, lectures and practical classes are carried out taking into account health limitations, individual capabilities and medical status (hereinafter referred to as individual characteristics) of the student. Compliance with the following general requirements is ensured: teaching aids for collective and individual use are provided, required technical assistance is provided by an assistant; buildings and premises where lectures and practical classes are taking place meet accessibility requirements, other arrangements lack of which makes it impossible or difficult to master the discipline are made.

6.2. Ensuring Compliance with General Requirements

When lectures and practical classes are carried out at the written application of the student, the following general requirements are met: lectures and practical classes for students with disabilities and special needs take place at the same location as for students who do not have disabilities, if this does not cause difficulties for students; an assistant (assistants), who provide(s) students with the necessary technical assistance taking into account individual characteristics of the student, is (are) provided; necessary teaching aids are provided, taking into account individual characteristics of the student.

6.3. Availability of the Internal Policies and Procedures of FSBEI HE PSMU of the Ministry of Health of Russia to Students with Disabilities in a Format Accessible to Them.

All internal policies and procedures of FSBEI HE PSMU of the Ministry of Health of Russia concerning the discipline are made available to students with disabilities in a format accessible to them.

6.4. Increase in the Time Limit of Interim Assessment for Students with Disabilities and Special Needs in Relation to the Established duration

Format of the interim assessment of academic performance within the scope of the discipline conducted for students with disabilities and special needs is selected taking into account individual characteristics of the students (orally, by writing on paper, by typing on a computer, as a test, etc.). The duration of the interim assessment in relation to the established duration is increased at the written application of the student with disabilities. Time limit for the student's preparation for the test is increased by at least 0.5 hours.

7. STAFFING REQUIREMENTS OF THE DISCIPLINE

Academic teaching personnel that ensure the implementation of the discipline education process meet the requirements of the Federal State Educational Standard of Higher Education for the 31.05.01 General Medicine for international students (in English) specialty; list of the aforementioned personnel is available on the website of the educational organization.

8. TUTORIAL WORK

Type of tutorial work	Forms and approaches to tutorial work	Assessment criteria
Assistance in personal growth	Overt Talks and problem-centric debates aimed at promotion of healthy lifestyle. Participation in interdepartmental conferences aimed at formation of healthy lifestyle and development of skills necessary to preserve and improve health.	Portfolio
	Covert – creating atmosphere and infrastructure. Developing a culture of healthy lifestyle, the ability to preserve and improve health. Creating atmosphere of kindness and respect with a high level of communication during implementation of the discipline.	
Civic position and values	Overt Conducting events that facilitate development of civil culture (roundtable discussions, discussions/debates, and talks). Short discussions on current significant events in case the latter occur.	Portfolio
	Covert Focusing on civic values-oriented position and legal awareness. Cultivating mindful social position during professional activity.	
Social values	Overt Highlighting aspects of organization of healthy lifestyle based on health-preserving technologies. Highlighting ecology-related questions, environmental issues as a factor affecting population health and select population risks.	Portfolio
	Covert Identification in social structure during period of education and in professional activity.	