

FEDERAL STATE BUDGETARY EDUCATIONAL INSTITUTION
OF HIGHER EDUCATION
«BASHKIR STATE MEDICAL UNIVERSITY»
OF THE MINISTRY OF HEALTHCARE OF THE RUSSIAN FEDERATION

DEPARTMENT REPRODUCTIVE HUMAN HEALTH
WITH COURSE OF IMMUNOLOGY

APPROVED by
Rector Pavlov B. N.

202_.

COURSE OVERVIEW FOR THE ACADEMIC DISCIPLINE
IMMUNOLOGY

(name of the academic discipline)

Field of study (specialty, code) Dentistry. 31.05.03

Form of education full-time
(full-time, evening, correspondence)

Duration of completing PEP 5 years
(standard period of education)

Academic year II

semester IV

Work with the teacher - 48 hours

examination/credit – 0 hours (IV
semester)

Lectures – 14 hours

total 48 hours

Practical lessons – 34 hours/ 0,94 credit units

(1,3credit units)

The development of the operational program for the academic discipline (module) was done on the basis of:

1. Federal state educational standards of higher education for the field of study (specialty) Dentistry. 31.05.03, approved by the Ministry of Education and Science of the Russian Federation «09» February 2016.
2. Curriculum for the specialty Dentistry. 31.05.03, approved by the Academic Council of the State Budgetary Educational Institution of Higher Education «Bashkir State Medical University» of the ministry of Healthcare of Russia on «26» June 2018., by the protocol № 6.
3. Professional standard general practitioner, approved by Order of the Ministry of Labor and Social Protection of the Russian Federation 21 March , 2017 No. 293n

Course overview for the academic discipline (module) was endorsed at the meeting of the department of reproductive human health with course of immunology, on «02» October 2021, by the protocol № 7

Head of the department reproductive human health with course of immunology _____ Kurcer M. A.)

Operational program for the academic discipline (module) was endorsed by the Academic Council of Dentistry faculty on «30_» June_ 2021, by protocol № 14

Chairperson of the Academic Council _____ (Kabirova M.F.)
of Dentistry faculty

developers:

Assistant of the department reproductive human health with course of immunology _____ Gaisina A.F.

Assistant of the department reproductive human health with course of immunology _____ Gaisina A.R.

Reviewers

Head of the Laboratory of Molecular Biotechnology and Genetic Engineering. Federal State Autonomous Educational Institution of Higher Education "South Ural State University (National Research University). MD, Professor _____ A.V. Zurochka.

Head of the Laboratory of Immunochemistry of Physiologically active substances. Institute of Physiologically Active Substances of the Russian Academy of Sciences. Doctor of Biological Sciences, Professor, _____ M.A. Myagkova.

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1. SUMMARY

Immunology is one of the most important biomedical disciplines, the subject of which is the protective mechanisms responsible for protecting the body from genetically alien substances, including pathogens. Discipline is represented by the main sections: "Basics of Immunology," "Immunodiagnosis," "Immunopathology," "Immunotherapy."

The "Basics of Immunology" section contains information about the development of immunology as a science, the stages of its formation, the definition of immunity, types of immunity, the general characteristic of the immune system and its basic functions; non-specific mechanisms of protection of the body (mechanical, physical-chemical, cellular, humoral); forms of immune response (antibody formation, immune phagocytosis, killer function of lymphocytes, allergies, immunological memory, immunological tolerance); antigens and their properties, the antigenic structure of microorganisms; antibodies, their properties; Dynamics of antibody formation; the main complex of histocompatibility.

The "Immunodiagnosis" section examines the antigen-antibody reactions used in diagnostic and immunological studies in most people. Detection in serum or blood plasma of a patient antibodies against antigens of the pathogen or antigens (e.g. cancer markers) makes it possible to diagnose the disease.

The section "Immunopathology" is devoted to the study of the reaction of hypersensitivity of immediate and slow types, mechanisms of their development, form of manifestation, methods of detection. Skin-allergic samples, their diagnostic value. Primary and secondary immunodeficiencies, autoimmune diseases.

The "Immunotherapy" section highlights the role of immunobiological drugs in specific prevention and treatment of infectious diseases. The section provides information about the modern classification of vaccines, how to prepare them and evaluate their effectiveness. Drugs for seroprophylaxis and serotherapy. Homologous and heterological serums. Immunoglobulins (normal and directed action). Principles of receiving, cleaning and titration of serums and immunoglobulins. Side effects of serotherapy and their prevention.

The discipline study process is aimed at forming the following competencies: JC-1, JC-5, **GPC -1, GPC -5, GPC -7, GPC -9, PC -1, PC-5, PC-21.**

The discipline study process is aimed at the formation of the following work functions: A/01.7, A/02.7, A/03.7, A/04.7, A/05.7, A/06.7.

2. Introduction

2.1. Aim and objectives of learning the discipline (module)

Aim of learning the academic discipline (module) Immunology is the acquisition of knowledge of theoretical questions, as well as principles of diagnostics, treatment and prevention of immune diseases.

The objectives of the discipline are

- the acquisition by students of knowledge about the immune system of the body, ensuring the maintenance of antigenic homeostasis of each individual, protecting the internal environment from a variety of foreign antigens; on the General laws of the formation of the immune reactions of the body, the complex and individually purchased non-specific protection mechanisms aimed at the detection and destruction of foreign agents, the immune status of the organism; about the peculiarities of local immunity of the oral cavity;
- acquisition of knowledge about the principles of laboratory diagnostics based on numerous and diverse reactions of the immune system in different periods of the disease, the development of immunological insufficiency, which will allow you to predict the course of the disease, monitor the treatment and prevention of diseases, prevent complications from other organs and systems;
- training students in the most important methods of immunological research, which allows to assess the functional state of the body's immune system in normal and in various clinical conditions, methods of setting immunological reactions;
- training of students to recognize immunological insufficiency and immuno-deficient States when examining a patient, when determining the severity of the infectious process;
- training of students in the ability to apply methods of immunological diagnostics of infectious diseases (serological identification of the pathogen, assessment of humoral and cellular immunity, the immune status of the body);
- training of students in choosing the best methods of immunological examination for infectious diseases and drawing up an algorithm for differential diagnosis;
- training in preventive measures to prevent the spread of infectious diseases by creating artificial immunity;
- training of students in the reception of first aid to patients in the event of anaphylactic shock;
- training students to choose optimal schemes for laboratory diagnostics of infectious diseases;
- training of students in the preparation of medical documentation (referral for research, protocols of research of clinical material);
- familiarization of students with the principles of organization and operation of the immunological laboratory;
- formation of communication skills with patients taking into account ethics and deontology depending on the identified pathology and characteristic features of patients;
- formation of skills for studying scientific literature and official statistical reviews
- formation of students' communication skills with the team.

2.2. Place of the academic discipline (module) in the structure of PEP for specialty

2.2.1. The academic discipline "Immunology" belongs to the basic part of block 1.

2.2.2. To study this academic discipline (module) the student should have

Biology

Know:

The main patterns underlying the processes occurring in the human body.

Own:

Medical and anatomical conceptual apparatus; the simplest medical and tools and microscopic analysis; methods of anthropogenetics; methods of ovo-and helminthoscopy.

Be able to:

Skills in handling optical equipment, working with micro-products, working with tables, diagrams, solving practical problems.

Create the following competencies:

GC-1, GC -5, **GPC -1, GPC -5, GPC -7, GPC -9, PC -21**

Physics and mathematics

Know:

Basic principles and laws of physics and mathematics; characteristics and effects of physical factors (electric current, electromagnetic fields, ionizing radiation, etc.) on the body.

Own:

The conceptual apparatus of physics and mathematics.

Be able to:

Analyze and select equipment for biomedical research, taking into account their capabilities and applications.

Create the following competencies:

GC -1, GC -5, **GPC -1, GPC -5, GPC -7, PC -21**

Chemistry

Know:

Safety rules and work in chemical and physical laboratories with reagents and devices; physical and chemical essence of processes occurring in a living organism at the molecular, cellular, and tissue levels.

Own:

Possession of the IUPAC nomenclature. Working with chemical reagents. Working with chemical dishes. Conducting chemical experiments (reactions, titration, etc.)

Be able to:

Conduct a search and make generalizing conclusions; explain the results of experiments based on theoretical data; work safely in a chemical laboratory and the ability to handle chemical utensils, reagents, work with electrical devices.

Create the following competencies:

GC -1, GC -5, **GPC -1, GPC -5, GPC -7, PC -21**

Biochemistry

Know:

Structure and functions of the most important chemical compounds. Main metabolic pathways. Diagnostically significant indicators of the composition of blood, urine, saliva, gastric juice and bile. Methods of statistical processing of the obtained results.

Own:

Skills of using biochemical constants to characterize the norm and signs of disease.

Be able to:

Use the metabolism map, biochemical reference materials, and laboratory equipment.

Create the following competencies:

GC -1, GC -5, GPC -1, GPC -5, GPC -7, GPC -9, PC -21

- Anatomy

Know:

Anatomical and topographical relationships of organs and parts of the body in an adult, children and adolescents; the biological essence of the processes occurring in the living body of an adult and a teenager at the tissue and organ levels.

Own:

Skills in determining the boundaries of organs, zonal and segmental innervation; vascular pulsation; find and show organs and the main details of their structure on x-ray images

Be able to:

Palpate the main bone and muscle landmarks on a person, determine the topographic contours of organs and the main vascular and nerve trunks; correctly name and demonstrate movements in the joints of the human body; schematically represent the internal structure of the Central nervous system.

Create the following competencies:

GC -1, GC -5, GPC -1, GPC -5, GPC -7, GPC -9, PC -1, PC -21

2.3. Requirements for the results of the development of academic discipline (module)

2.3.1. List the types of professional activities that underlie the teaching of this discipline :

- Medical
- Research

2.3.2. The study of this academic discipline is aimed at the formation of students in the following general cultural (GC), general professional (GPC), professional (PC) competencies:

№ п/п	Competency number (index) / work function	Contents of competency (or part of it)	As a result of studying the discipline, students should have:			The list of practical skills to develop the competence	Evaluation resources
			Knowledge	skills	competencies		
1	2	3	4	5	6	7	8
1	Gc-1	Ability to abstract thinking, analysis, synthesis.	Physico-chemical and biochemical methods of analysis of the biological samples; features of the course of biochemical processes in an adult and a child, diagnostically significant	Use educational, scientific, popular science literature, the Internet. Use a metabolic map, biochemical reference materials, laboratory	Basic technology for converting information; Internet technology; skills of using biochemical constants to characterize the norm and	serum protein concentration, determination of serum albumin content, quantitative determination of serum bilirubin, determination of alkaline reserve of blood, time of recalcification	Interview, solving situational problems, tests, essay, self-study assignments, colloquium.

			norms of biochemical parameters of a healthy person.	equipment.	signs of the disease.	n of blood plasma; colloid resistance tests of serum proteins; determination of catalase activity, blood peroxidase. Determination of indicators of physicochemical properties of urine, determination of chemical components of normal urine, determination of pathological components of urine; quantification of free oxyproline in urine. Study of the mineral composition of bone and tooth tissues.	
2	GC-2	Ability for self-development, self-realization, self-education, use of creative potential	the main patterns underlying immunological processes occurring in the human body	terminology, basic information conversion technologies, text table editors, Internet search terminology, basic information conversion technologies, text table editors, Internet	evaluate the state of the immune system, analyze data and research results, use educational, scientific, literature, and the Internet; use biological equipment	evaluate the state of the immune system, analyze data and research results, use educational, scientific, literature, and the Internet; use biological equipment	Control work, interview, situational tasks, written testing

				search collection of anamnesis, sampling of material for research, interpretation of research results.			
3	GPC-1/ A/01.7, A/02.7, A/03.7, A/04.7, A/05.7, A/06.7		The structure and functions of the most important biological compounds. The main metabolic pathways. Diagnostically significant indicators of the composition of blood, urine, saliva, gastric juice and bile. Methods of statistical processing of the data obtained.	Use educational, scientific, popular science literature, the Internet. Use a metabolic map, biochemical reference materials, laboratory equipment.	Internet technology; skills of using biochemical constants to characterize the state and symptoms of the disease	Clinical and diagnostic value for determination of proteinograms, colloid resistance samples of blood serum proteins, saliva and urine amylase activity, alanine and aspartate aminotransferase, creatine	Interview, solving situational problems, tests, essay, self-study assignments, colloquium.
4	GPC-5/ A/02.7 A/ 03.7 A/04.7 A/ 05.7 A/06.7	ability and willingness to analyze the results of their own activities to prevent professional mistakes	biological properties of microorganisms, their role in infectious pathology, diagnostic methods; immune reactions of the body to foreign agents features of immunity in various pathological conditions	collection of anamnesis, sampling of material for research, interpretation of research results	evaluate the state of the immune system, analyze data and research results, use educational, scientific, literature, and the Internet; use biological equipment	evaluate the state of the immune system, analyze data and research results, use educational, scientific, literature, and the Internet; use biological equipment	Control work, interview, situational tasks, written testing, individual homework
5	GPC-7/	readiness to use basic	basic laws of physics,	medical and	use biological	analyze the material,	Control work,

	A/05.7	physical-chemical, mathematical and other natural science concepts and methods in solving professional tasks	physical laws underlying immunological processes occurring in the human body; - characteristics and biophysical phenomena and patterns underlying immunological processes occurring in the human body	anatomical conceptual apparatus; the simplest medical instruments	terminology	systematize data, use educational, scientific, popular science literature, the Internet	interview, situational tasks, written testing
6	GPC-9/ A/02.7, A/03.7, A/04.7	The ability to assess morphological, physiological States and pathological processes in the organism for the solution of professional tasks.	- physical and chemical essence of the processes occurring in a living organism at the molecular, cellular, tissue and organ levels - basic laws of development and vital activity of adult and child organism - functional systems of the human body, their regulation and self-regulation when exposed to the environment in normal and pathological conditions	the basic technology of converting the information, text, tabular editors, search in the Internet	analyze the material, systematize data, use educational, scientific, popular science literature, the Internet	analyze the material, systematize data, use educational, scientific, popular science literature, the Internet	Control work, interview, situational tasks, written testing, individual home assignments
7	PC-1, A/ 05.7	ability and readiness to implement	structural and functional	- the skill of comparing	explain the nature of	evaluate the state of the immune	Control work, interview,

		a set of measures aimed at preserving and strengthening health and including the formation of a healthy lifestyle, prevention of the occurrence and (or) spread of diseases, their early diagnosis, identification of the causes and conditions of their occurrence and development, as well as aimed at eliminating the harmful influence of environmental factors on human health	bases of diseases and pathological processes, causes, main mechanisms of development and outcomes of typical immunological processes, disorders of the functions of organs and systems.	morphological and clinical manifestations of diseases.	deviations in the course of development that can lead to the formation of variants of abnormalities and defects; - analyze issues of General pathology and modern theoretical concepts and trends in medicine.	system, analyze data and research results, use educational, scientific, literature, and the Internet; use biological equipment	situational tasks, written testing
8	PC-5/ A/02.7 A/02.7 A/ 03.7 A/04.7	Readiness to collect and analyze patient complaints, anamnesis data, examination results, laboratory, instrumental, pathologic-anatomical and other studies in order to recognize the	biological properties of microorganisms, their role in infectious pathology, diagnostic methods; immune reactions of the body to foreign agents features of immunity in various pathological conditions	collection of anamnesis, sampling of material for research, interpretation of research results	evaluate the state of the immune system, analyze data and research results, use educational, scientific, literature, and the Internet; use biological equipment	evaluate the state of the immune system, analyze data and research results, use educational, scientific, literature, and the Internet; use biological equipment	Control work, interview, situational tasks, written testing, individual homework

		condition or eliminate the fact of the presence or absence of the disease.					
9	PC-21	Ability to participate in scientific research.	modern achievements of world and domestic science, areas of practical application in medicine of scientific achievements	terminology, basic information conversion technologies, text table editors, Internet search	use educational, scientific, popular science literature, the Internet; use biological equipment ; work with magnifying equipment ; make calculations based on the results of the experiment	use educational, scientific, popular science literature, the Internet; use biological equipment; work with magnifying equipment; make calculations based on the results of the experiment	individual home assignments, abstract

3. Core part

3.1. The contents of academic discipline (module) and types of academic activities

Type of academic activity	Total hours/ credit units
1	2
Contact work (total), including:	48/1.33
lectures (L)	14/0.39
Practical classes (PC), seminars (S)	34/0.94
Laboratory workshops (LW)	
Independent work of students (CPO), as well as:	
Case history (CH)	
project (P)	
report (Peφ.), if available as per the study plan	
calculative and graphical works (CGW), if available according to the curriculum	
Preparation for classes (PC)	
Preparation for routine control (PRC)	

Preparation for intermediate control (PIC)		
...		
...		
Type of intermediate attestation	credit (C)	
Total: total workload	hours.	48
	CU	1.33

3.2. Sections of the discipline and competence that must be developed after studying the discipline

Serial№	Competence № / work function	Title of the section of the discipline	Section content in didactic units (topics of the sections and subsections)
1	2	3	4
1	GC-1, GC-5, GPC-1, GPC-7, GPC-9, PC-1, PC-21 A/01.7 A/02.7 A/03.7 A/04.7 A/05.7 A/06.7	Basics of immunology	The concept of "immunity" as a mechanism of protection from foreign agents, immunity to infectious diseases; types of immunity. Antigens, antibodies. Non-specific and specific protection factors. Formation and development of the immune system. Central and peripheral organs of the immune system; cells involved in the formation of the immune response. Regulation of the immune response. Forms of the immune response.
2	GC -1, GC -5, GPC -1, GPC -5, GPC -7, GPC -9, PC -1, PC -5, PC -21 A/01.7 A/02.7 A/03.7 A/04.7 A/05.7 A/06.7	Immunodiagnosis	Mechanism, components of major immune reactions, diagnostic drugs. Methods for assessing immunity.
3	GC -1, GC -5, GPC -1, GPC -5, GPC -7, GPC -9, PC -1, PC -5, PC -21 A/01.7 A/02.7 A/03.7 A/04.7 A/05.7 A/06.7	Immunopathology	Allergy. Features of immunity in infectious diseases. Autoimmune pathology. Diagnosis of immunopathological conditions
4	GC -1, GC -5, GPC -1, GPC -5, GPC -7, GPC -9, PC -1, PC -5, PC -21 A/01.7 A/02.7 A/03.7 A/04.7 A/05.7 A/06.7	Immunotherapy	Principles of immunoprophylaxis and immunotherapy. Immunobiological drugs for the prevention and treatment of infectious diseases, their classification (vaccines, serums, immunoglobulins, etc.).

3.3 Sections of the academic discipline (module), academic activities and forms of control test

Series №	Semester №	Title of the section of the discipline (module)	Types of academic activities, incl. independent work of students (in hours)				Type of routine control of the progress (according to the weeks of semester)
			L	PS	IAS	Total	
1	2	3	4	5	6	7	8
1	5	The basics of immunology	4	8		12	Testing. Oral survey. Control work.
2	5	Immunodiagnosis	0	4		4	Testing. Oral survey. Control work.
3	6	Immunopathology	8	16		24	Testing. Oral survey. Control work.
4	6	Immunotherapy	2	6		8	Testing. Oral survey. Control work.
		ИТОГО:	14	34		48	Testing total

3.4. The topics of the lectures and the number of study hours of the discipline (module) per semester

Series №	topics of the lecture in the discipline (module)	semester
		4
1	2	3
1	The subject, purpose and objectives of immunology. Immunity, its species. Factors of non-specific resistance. Acquired immunity and forms of immune response.	2
2	Antigens, properties. Immunocompetent cells, properties. Antibodies. The structure and function of immunoglobulins. Antibody dynamics. Immune response: humoral and cellular. Intercellular cooperation in the immune response. Immunological memory. Immunological tolerance.	2
3	Allergic reactions	2
4	Primary immunodeficiencies	2
5	Secondary immunodeficiencies	2
6	Autoimmune pathology	2
7	Principles of immunotherapy. Immunobiological drugs.	2
	Total	14

3.5. The topics of the practical classes and the number of study hours of the discipline (module) per semester

№ п/п	Topics of the practical classes in the basic part of the discipline according to FSES and types of control	Volume per semester
1	2	3
1	Immunity, species. Factors of non-specific resistance. Acquired immunity. Forms of immune response. Antigens.	4
2	Organs of the immune system. Immune-competent	4

	cells. Antibodies. Immuno-diagnostic reactions.	
3	Forms of immune response. Immuno-diagnostic reactions. Intercellular cooperation in the immune response. Immunological reactions involving complement.	4
4	Allergic diseases.	4
5	Clinical immunology. Primary immunodeficiencies	4
6	Secondary immunodeficiencies	4
7	Autoimmune diseases	4
8	Principles of immunoprophylaxis and immunotherapy.	4
9	Credit.	2
	Total	34

3.6. Laboratory workshop - not provided by the curriculum

3.7. Independent activities of the student

3.7.1. Types of independent activities of the student (IAS)

Serial№	Semester №	Title of the section of the discipline (module)	Types of IAS	Total hours
1	2	3	4	5
1	4	The basics of immunology: Stages of immunology formation. Relationship between the mother's and fetal immune systems	Writing abstracts	11
2	4	Immunity theories.	Preparing for classes	5
3	4	Immunopathology: Features of anti-mushroom, antiprotozoa and antitumor immunity.	Preparing for classes	10
4	4	Immunotherapy: Immunomodulators Immunobiotechnology	Writing abstract Preparation for the test	5 5
Total hours in the semester:				
				36

3.7.2. Approximate topics of essays, term papers (if available, as per the curriculum), control questions

semester № 4

1. Stages of immunology formation.
2. Relationship between the immune systems of the mother and the fetus.
3. The immune system of the human body. Central and peripheral organs.
4. Characteristics of antigen-antibody reactions.
5. Cytokines of immunocompetent cells
6. The main complex is to have a type I and II histocompatibility.
7. Features of anticancer immunity.

3.8. Evaluation resources for monitoring the progress and results of acquisition of knowledge of the academic discipline (module)

KNOWLEDGE OF THE ACADEMIC DISCIPLINE (MODULE)

3.8.1. type of control and attestation, types of evaluation resources

serial№	Semester №	Types of control	Title of the section of the discipline (module)	Evaluation resources		
				type	Number of questions and tasks	Number of independent variants
1	2	3	4	5	6	7
1	4	IC, CC	The basics of	Testing.	10	5

			immunology	Interview Monitoring the implementation of IAS.		
2	4	IC, CC	Immunodiagnosis	Testing. Interview Monitoring the implementation of IAS.	20	5
3	4	IC, CC	Immunopathology	Testing. Interview Monitoring the implementation of IAS.	10	5
4	4	IC, CC	Immunotherapy	Testing. Interview Monitoring the implementation of IAS.	20	5

3.8.2. Samples of evaluation resources:

For initial control (IC)	The main function of the immune system: 1. Control of proliferation processes 2. Maintaining the molecular permanence of organism 3. Maintaining the body's genetic homeostasis 4. Cell Recycling Answer:3
	By origin, immunity can be: 1. Specific 2. Active 3. Acquired Answer: 3.
	Antibodies are ...: 1. Immunoglobulins that engage in specific interaction with antigens 2. Proteins of the global fraction of human serum, which are formed when ingested by antigens and specifically interact with them 3. Gamma-globulins serum, consisting of two severe and two light polypeptide chains associated with disulfide bonds 4. Special soluble proteins synthesized by plasma cells. Answer: 2.
For current control (CC)	To characterize the properties of immunoglobulins use indicators: 1. Specificity, avidity, affinity, heterogeneity 2. Specificity, affinity, avidity, valence 3. Specificity, avidity, affinity, valence, heterogeneity 4. Specificity, affinity, avidity. Answer: 3.
	Name the ligand pair receptor needed to co-stimulate the APC's T-helpers and without which the presentation of the T-helper antigen can lead to its functional inactivation:

	1. CD 80 / CD 28 2. MNC Class 2 / CD 4 3. MNC Class 1 / CD 8 4. MNC Class 2/7 CR Answer: 1.
	Name the Ig class that passes through the placenta: 1. Ig A 2. Ig G 3. Ig M 4. Ig E Answer: 2.
For final control (FC)	Name the process that protects the body from repeated interventions of infectious agents: 1. Immune tolerance 2. Immune Memory 3. Hypersensitivity 4. Immune Paralysis Answer: 2
	Part of the antibody molecule responsible for activating the complement: 1. "L" - chain 2. Fs - fragments 3. Fab - fragments 4. Active centers 5. H-Chain Answer: 2
	Name the Ig class, which is an indicator of acute infection: 1. Ig A 2. Ig G 3. Ig M 4. Ig E Answer: 3.

3.9 EDUCATIONAL, METHODOLOGICAL AND INFORMATIONAL SUPPORT FOR THE ACADEMIC DISCIPLINE (MODULE)

The main literature

Serial№	Title	Author(s)	Year, place of publication	Number of copies	
				In library	At the department
1	2	3	4	7	8
•	Basic Immunology: Functions and Disorders of the Immune System [Текст] : [учебное издание]	A. K. Abbas, A. H. Lichtman, S. Pillai.	Elsevier, 2016 – 335 p.	80	0

Additional literature

Serial №	Title	Author(s)	Year, place of publication	Number of copies	
				In library	At the department
1	2	3	4	7	8
•	Lectures in immunology: курс лекций	Maianskii, A. N.	N. Novgorod: Publishing	40	0

			house NSMA, 2004 – 256 p.		
•	IMMUNOLOGY	Khaitov R.M.	2008 – 256 c.on-line.	access mode: ЭБС «Консультант студента» http://www.studmedlib.ru/book/ISBN9785970407042.html	unlimited access
•	Fundamental Immunology.	Lippincott Williams & Wilkins	2008 –on-line	access mode: Database«LWW Medical Book Collection 2011» http://ovidsp.ovid.com	unlimited access

3.10. Material and technical support of the discipline (module)

The use of chambers, laboratories, laboratory and instrumental equipment, training rooms for students.

Multimedia complex (laptop, projector, screen), TV, video camera, slidescope, VCR, PC, video and DVD players, monitors. Sets of slides, tables / multimedia visual materials on various sections of the discipline. Movies. Situational tasks, test tasks on the topics studied. Boards.

3.11. Educational techniques

Used educational technologies in the study of this discipline:

81.8% of interactive classes of the classroom.

Examples of interactive forms and methods of conducting classes:

Non-simulation technologies: lectures (visualization, problematic), discussions, training with practical tasks, laboratory tasks, round tables.

Simulation technologies: role-playing and business games, design and analysis of situations.

3.12. Sections of the discipline (module) and interdisciplinary links with subsequent disciplines

Serial №	The name of the subsequent disciplines	Sections of the discipline required to study subsequent disciplines			
		1	2	3	4
1	Pharmacology	+	+	+	+
2	Pathological anatomy	+	+	+	+
3	General hygiene	+			
4	Pathological physiology	+	+	+	+
5	Professional cycle disciplines	+	+	+	+

4. Methodical recommendations on the organization of the study of the discipline:

Training consists of contact work (34 hours), including a lecture course (14 hours) and practical exercises (34 hours), and self-study (36 hours). The main academic time is allocated to a lecture course and practical exercises to study the program course of immunology.

When studying the discipline, you need to use knowledge, skills formed by previous disciplines (biology, school course, physics, chemistry, biochemistry, anatomy), general cultural (GC-1, GC5), general professional (GPC-1, GPC -5, PC-7, PC-9) and professional (PC GC -1, GC -5, GC -21) competencies and master practical skills - solving the problem.

Practical classes include oral survey and control work, include demonstration of multimedia videos, tables, slides, use of visual aids, situational problem solving, and test assignment responses. In accordance with the requirements of the FGOS VO, active and interactive forms of training (role and business games, training, game design, computer simulation) are widely used in the training process. The proportion of classes conducted in interactive forms is at least 30% of the classroom.

The independent work of students involves preparation for practical classes, current and intermediate control and includes work with basic and additional literature, Internet resources, writing abstracts.

Working with academic literature is considered as a form of educational work on the discipline "Immunology" and is carried out within the hours allotted for its study (in the Section of IAS).

Each student is provided with access to the library funds of the university and the department.

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For each section of the discipline developed guidelines for students on practical classes- №13 and guidelines for teachers of lectures-№10.

Writing an abstract contributes to the formation of skills in working with literary sources, analyzing data and presenting the material in a logical sequence.

The student's work in the group creates a sense of collectivism and sociability. The initial level of students' knowledge is determined by testing, the current control of the subject assimilation is determined by an oral survey during classes, when solving typical situational tasks and responses to test tasks. At the end of the study, the study of the academic discipline is conducted intermediate knowledge control using test control, oral answer to questions on tickets, testing of practical skills and solving situational problems.

Questions on academic discipline (module) are included in the Final state certification of graduates.

5. Protocols of coordination of Course Overview (CO) with other disciplines of the specialty, extracts from protocols of CO approval at meetings of the department, Education board (EB), Cyclic Educational Commission (CEC), two external reviews from different institutions of higher education are attached to the Course Overview (see below for sample forms)

The update list is filled out annually if there are changes in the name of the institution, department, revision of the curriculum, updates in the list of references, etc.