

**For the register of educational programs**

**Master's degree in the double-degree educational program "Pharmacy and biotechnology of immunobiological drugs"**

**scientific and pedagogical direction (duration - 2 years)**

1	Name of the educational program	"Pharmacy and biotechnology of immunobiological drugs "
2	Type of EP (current, new, innovative)	innovative
3	Purpose of the EP	Formation of a high level of professional competencies and research skills among students in the main areas of the pharmaceutical and biotechnological industry in the context of the development and production of immunobiological drugs
4	Features of the EP (none, joint, double-diploma)	double-diploma
5	Partner university	Saint Petersburg State Chemical and Pharmaceutical University, Saint Petersburg
6	Learning outcomes (at least 8 LO)	<p><b>LO 1</b> Demonstrates knowledge and understanding of the interdisciplinary nature of research in the field of pharmacy and biotechnology of immunobiological drugs.</p> <p><b>LO 2</b> is able to acquire new knowledge and skills of an applied nature in research, professional and pedagogical activities in the field of pharmacy and biotechnology of immunobiological drugs.</p> <p><b>LO3</b> is able to solve problems in the field of pharmacy and biotechnology of immunobiological drugs within its qualification based on scientific approaches.</p> <p><b>LO4</b> Uses scientific information for the development of pharmacy, biotechnology of immunobiological drugs and the introduction of new approaches within its qualifications.</p> <p><b>LO 5</b> Clearly and unambiguously communicates information, ideas, conclusions, problems and solutions to both specialists and non-specialists in their field of qualification in the field of pharmacy and biotechnology of immunobiological drugs.</p> <p><b>LO 6</b> Plans professional activities in its field of qualification in the field of pharmacy and biotechnology of immunobiological drugs, based on modern achievements of science and practice.</p> <p><b>LO7</b> is engaged in professional growth, demonstrates introspection skills, experience for teaching at the higher education level.</p>
7	Form of study	full-time
8	Language of instruction	russian

9	Volume of loans	120
10	Awarded academic degree	Master of Medical Sciences in the double-diploma educational program "Pharmacy and Biotechnology of immunobiological drugs"
11	EP accreditation (name of the accreditation body, accreditation validity period)	-

### Information about disciplines:

№	Name of the module / disciplines	Summary of the discipline	Cycle	Component	Credits	Generated learning outcomes (codes)						
						LO1	LO2	LO3	LO 4	LO5	LO6	LO7
<b>Cycle of basic disciplines. University component</b>												
1	History and philosophy of science	The discipline considers general problems of philosophy, history and methodology of science, philosophical problems of social and humanitarian knowledge and problems of the philosophy of law.	BD	UC	3				+	+	+	+
2	Foreign language	Deepening and development of skills and abilities for practical knowledge of colloquial and everyday speech and the language of the specialty for the active use of a foreign language both in everyday and in professional communication.	BD	UC	3		+		+			+
3	Pedagogy of higher education	The discipline is aimed at developing a deep understanding of the theoretical foundations and practical aspects of teaching in higher education.	BD	UC	3	+	+			+		+
4	Management Psychology	The discipline contributes to the formation of ideas about modern management trends, studies the influence of psychological aspects on management activities	BD	UC	3		+			+		+
5	Economics and innovation	Interrelated fields of knowledge that study the processes of creation, development and application of new	BD	UC	3	+	+	+				

		ideas, technologies, products and services in order to achieve economic growth and improve people's lives										
6	Pedagogical practice	Practice aimed at gaining experience working with students, familiarization with the pedagogical process and the application of theoretical knowledge and skills in a real educational environment.	BD	UC	5	+	+			+		+
<b>Cycle of basic disciplines. Component of choice</b>												
7	Fundamentals of mathematical modeling	A discipline that studies the principles and methods of creating mathematical models for describing and analyzing various phenomena and systems. Within the framework of this discipline, students learn to express real processes and systems in the form of mathematical equations and formulas, develop and analyze models using mathematical methods and computer programs.	BD	CC	3	+	+		+		+	
8	Statistical methods and experimental planning	The discipline studies the principles and techniques of using statistics to design, conduct, and analyze experiments. It helps researchers make informed decisions based on the collected data and optimize the research process.	BD	CC	4	+	+		+		+	
9	Management of the best available technologies to ensure the technological process based on biotechnology	The discipline studies an approach aimed at the effective use of modern technologies in biotechnological production. It includes the identification, selection and implementation of the best available technologies in processes and operations related to biotechnological processes.	BD	CC	4	+	+	+	+		+	
10	Design and organization of pharmaceutical production	studies the principles and methods of designing and organizing the	BD	CC	4	+	+	+			+	

	according to GMP	production of biopharmaceuticals in compliance with the requirements of Good Manufacturing Practice (GMP). Undergraduates study the basic principles of GMP, such as documentation of procedures, requirements for equipment and premises, validation and qualification processes, personnel requirements and quality control.										
<b>Cycle of profile disciplines. University component</b>												
11	Fundamental and applied aspects of modern molecular biology	The discipline explores the structure and function of molecules in living organisms, as well as the application of this knowledge to the development of new biological methods and products.	PD	UC	3	+	+	+	+		+	
12	Information technology in professional activities	A discipline that studies the use of computers, software, and other information technology tools to work effectively and achieve goals in a work environment.	PD	UC	3	+	+	+	+		+	
13	Methods of analysis of immunobiological preparations	The discipline studies methods and techniques used for the analysis of immunobiological preparations. This includes the development and optimization of methods for assessing the quality and stability of drugs, the study of their composition and structure, as well as the analysis and control of their biological activity and effectiveness.	PD	UC	3	+	+	+	+			
14	Modern problems of biotechnology	The discipline deals with the study of topical issues and challenges associated with the application of biotechnological methods in various fields.	PD	UC	3	+		+	+	+		
15	Immunobiochemistry	The discipline studies the chemical aspects of the functioning of the	PD	UC	3	+	+	+	+			

		immune system and its interaction with various molecules and structures in the body. Immunobiochemistry helps to understand the basis of the immune response and the development of diseases, and also contributes to the development of new diagnostic and therapeutic approaches in medicine..										
16	Management of scientific and production teams	The discipline studies the principles and methods of effective leadership of groups of people working in a scientific or industrial environment. Management of scientific and production teams is aimed at optimizing work processes, stimulating the creative potential and development of employees in order to achieve success and high results in scientific or production activities.	PD	UC	3	+				+	+	+
17	Microbiological control in biotechnological production	discipline that deals with the observation, analysis and control of microbiological aspects in the production process of biotechnological products. It includes methods and techniques for determining and identifying microorganisms, monitoring their abundance and activity, and assessing the quality and sterility of products.	PD	UC	3	+	+	+	+			
18	Immunobiological preparations based on microorganisms	The discipline studies the development and production of medicines based on the use of microorganisms, such as bacteria or fungi, to stimulate the body's immune system. These drugs may include vaccines, toxoids, antitoxins, and other biological products that can activate the immune	PD	UC	3	+	+	+	+			

		system to prevent or treat infectious, autoimmune, or neoplastic diseases.										
19	Research practice: technologies for obtaining immunobiopreparations	As part of the research practice, undergraduates gain practical experience in conducting scientific research. The purpose of research practice is to develop the skills of planning, conducting and analyzing scientific research, as well as deepening the understanding of a particular field of knowledge.	PD	RP	3	+	+	+			+	+
20	Production practice: technological practice	The practical part of the educational process of training qualified workers and specialists, which takes place, as a rule, at various enterprises in real production conditions.	PD	CC	4	+	+	+	+	+	+	+
<b>Cycle of profile disciplines. Component of choice</b>												
21	Technologies for obtaining immunobiopreparations	The discipline studies methods and processes of production of biological preparations based on the body's immune system. This discipline also studies quality control, production standards and regulatory aspects related to the development and production of immunobiopreparations.	PD	CC	3	+	+	+			+	+
22	Modern equipment for immunobiological production	The discipline studies various types of equipment used in the production of immunobiological preparations, modern technologies and equipment used in the production of immunobiological preparations. Undergraduates will learn how to choose and use the optimal equipment for the production of immunobiological preparations, taking into account the requirements for safety, quality and efficiency of the process.	PD	CC	3	+	+	+			+	

23	Quality assurance of biotechnological medicines	Discipline related to ensuring high quality and compliance with standards of biotechnological medicines, including development, production, quality control and regulatory aspects.	PD	CC	3	+		+	+			
24	Foreign language for business contacts	The discipline helps to develop the skills of written and oral communication, reading and understanding business vocabulary and grammar in a foreign language, necessary for successful business negotiations, presentations, letters and other types of business communication.	PD	CC	3	+			+	+		
25	Foreign language for scientific work	teaches the use of a foreign language in an academic context. It helps to develop the skills of reading and understanding scientific literature in a foreign language, writing scientific articles and reports, as well as oral communication on scientific topics, as well as communication in the international academic community.	PD	CC	3	+			+	+		
26	Technological environments of pharmaceutical production	The discipline studies various systems and equipment, such as clean rooms, ventilation, water supply and purification systems, automated control and monitoring systems, as well as other technical aspects necessary to ensure the safety, quality and efficiency of production processes in the pharmaceutical industry.	PD	CC	3	+	+	+	+			
27	Technical thermodynamics	The discipline studies the basic concepts of thermodynamics, including heat, work, energy and entropy, equations of state, heat transfer, the operation of gases and liquids, the efficiency of thermal and refrigeration plants and other aspects necessary to understand the analysis	PD	CC	3	+	+	+	+			

		and optimization of energy processes and technical systems.										
28	Qualification of technological equipment and validation of technological processes	The discipline studies the methods and procedures necessary to assess and confirm the compliance of technological equipment and processes with established requirements and standards. Students will learn about the equipment qualification process, which includes calibration, verification and testing, and the process validation process, which includes the definition and verification of parameters, quality and safety criteria.	PD	CC	3	+	+	+	+			
29	Validation of cleaning	The discipline studies the evaluation and validation of the effectiveness of cleaning methods in the production of pharmaceutical and biotechnological products, including the principles, methodology and experimental verification of the removal of contaminants and contaminants.	PD	CC	3	+	+	+	+			
30	<b>Production practice: SRW 1 (scientific research work)</b>	PP provides students with the opportunity to participate in scientific research, carry out independent work on a chosen topic and develop scientific research skills under the guidance of experienced scientific supervisors.		III	24	+	+	+	+	+		
31	<b>Preparation for the defense procedure and defense of the final qualifying work (Final certification)</b>	The procedure includes a detailed study of the research topic, the development of the structure and content of the work, as well as the presentation of the results of the study before the commission in order to demonstrate the knowledge, skills and professional competence acquired.			12							



