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**Federal State Autonomous Educational Institution of Higher Education
PEOPLES' FRIENDSHIP UNIVERSITY OF RUSSIA NAMED AFTER PATRICE
LUMUMBA
RUDN University
Institute of Medicine**

educational division (faculty/institute/academy) as higher education programme developer

COURSE SYLLABUS

Immunology

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 “Immunology” is to form students’ modern knowledge about the structure and functions of the immune system, types of immunity; distinctive characteristics of immune reactions under normal or pathological conditions; methods of clinical, laboratory and instrumental diagnostics, traditional and innovative directions in prevention, treatment of patients with immunopathology.

The above goal can be reached by the solution of a number of objectives:

- building up the students’ skills in comprehension about the structure of immune system, its characteristics in different ages, cellular and molecular development mechanisms and functioning of the immune system, the main stages, types, genetical control of immune response, immune diagnosis.
- building up the students’ knowledge and skills on estimating laboratory results in immunodeficiency conditions, allergic and other types of immune-dependent diseases.
- building up the students’ knowledge in primary immunodeficiency, HIV-infection, AIDS and secondary immunodeficiency conditions.
- building up the students’ skills in determination of the AB0 and RhD blood group systems.
- building up the students’ knowledge about hypersensitivity reactions, classification its according to Gell and Coombs, etiology and pathogenesis of I-IV hypersensitivity types.
- building up the students’ knowledge about transplantation immunology, graft rejection reactions.
- building up the students’ knowledge about tolerance and autoimmunity.
- building up the students’ knowledge about antitumor immunity.

2. REQUIREMENTS FOR LEARNING OUTCOMES

Mastering the course (module) «**Immunology**» is aimed at the development of the following competences /competences in part: GC-1, GPC-6, PC-1,5,6.

Table 2.1. List of competences that students acquire through the course study

Competence code	Competence descriptor	Competence formation indicators (within this course)
GC-1	Being able to implement critical analysis of problem situations based on systems approach, develop an action strategy	GC-1.1. Analyzing scientific and technical literature and regulatory documentation of medical organizations.
		GC-1.2. Assessing in a critical way the reliability of information sources; working with contradictory information from different sources.
		GC-1.3. Understanding trends, strategic objectives, and problems in the field of healthcare. Guiding in the legislative framework for the development of strategies.

Competence code	Competence descriptor	Competence formation indicators (within this course)
		GC-1.4. Analysis and evaluation of the economic potential, financial stability and risks of the organization.
GPC-6	Being able to organize patient care, provide primary health care, provide work organization and professional decision-making in case of emergency conditions at the pre-hospital stage, in emergency situations, epidemics and in foci	<p data-bbox="815 371 1473 555">GPC-6.1. Possessing of algorithms for providing first aid in emergency situations, including in extreme conditions and foci of mass destruction.</p> <p data-bbox="815 566 1473 750">GPC-6.2. Ability to identify conditions requiring emergency medical care, including clinical signs of sudden cessation of blood circulation and respiration.</p> <p data-bbox="815 761 1473 1003">GPC-6.3. Ability to provide emergency medical care to patients in conditions that pose a threat to the life of patients, including clinical death (stopping vital functions of the human body (blood circulation and (or) breathing)).</p>
PC-1	Being able to provide medical care to the patient in emergency or emergency forms	<p data-bbox="815 1037 1473 1144">PC-1.1. Ability to assess the condition of a patient requiring medical care in emergency or emergency forms.</p> <p data-bbox="815 1155 1473 1346">PC-1.2. Ability to recognize conditions arising from sudden acute diseases, exacerbation of chronic diseases without obvious signs of a threat to the patient's life and requiring urgent medical care.</p> <p data-bbox="815 1357 1473 1547">PC-1.3. Ability to provide emergency medical care to patients with sudden acute diseases, conditions, exacerbation of chronic diseases without obvious signs of a threat to the patient's life.</p> <p data-bbox="815 1559 1473 1666">PC-1.4. Ability to recognize states, posing a threat to the patient's life, including conditions of clinical death.</p> <p data-bbox="815 1677 1473 1827">PC-1.5 Ability to provide emergency medical care to patients with conditions that pose a threat to the patient's life, including clinical death.</p> <p data-bbox="815 1839 1473 1946">PC-1.6. Ability to use medicines and medical devices when providing medical care in emergency or emergency forms.</p>
PC-5	Being to conduct and monitor the effectiveness of measures for the	PC-5.1. Ability to organize and conduct medical examinations taking into account age, health status, profession in accordance with

Competence code	Competence descriptor	Competence formation indicators (within this course)
	prevention and formation of a healthy lifestyle and sanitary and hygienic education of the population	applicable regulatory legal acts and other documents.
		PC-5.2. Ability to organize and control the immune prophylaxis of infectious diseases in the adult population in accordance with the current procedures for providing medical care, clinical recommendations (treatment protocols) on the provision of medical care, taking into account the standards of medical care.
		PC-5.3. Ability to carry out medical examination of the adult population for the purpose of early detection of chronic non-communicable diseases and the main risk factors for their development in accordance with current regulatory legal acts and other documents.
		PC-5.4. Ability to conduct dispensary monitoring of patients with identified chronic non-communicable diseases.
		PC-5.5. Ability to prescribe preventive measures to patients taking into account risk factors in accordance with the current procedures for providing medical care, clinical recommendations (treatment protocols) on the provision of medical care, taking into account the standards of medical care.
		PC-5.6. Ability to monitor compliance with preventive measures.
		PC-5.8. Ability to issue and send to the territorial body of the Federal Service for Supervision in the Field of Consumer Rights Protection and Human Well-being an emergency notification when an infectious or occupational disease is detected.
		PC-5.9. Ability to carry out anti-epidemic measures in the event of an outbreak of infection, including quarantine measures for the detection of particularly dangerous (quarantine) infectious diseases.
		PC-5.10. Ability to form healthy lifestyle programs, including programs to reduce alcohol and tobacco consumption, prevent and combat non-medical use of narcotic drugs and psychotropic substances.
		PC-5.11. Ability to evaluate the effectiveness

Competence code	Competence descriptor	Competence formation indicators (within this course)
		of preventive work with patients.
PC-6	Being to maintain medical records and organize the activities of the nursing staff at the disposal	PC-6.1. Ability to constitute a work plan and a report on its work, issue a passport of a medical (therapeutic) site.
		PC-6.2. Ability to analyze the indicators of morbidity, disability and mortality to characterize the health of the attached population.
		PC-6.3. Ability to maintain medical records, including in electronic form.
		PC-6.4. Ability to monitor the performance of official duties by a district nurse and other medical workers at their disposal.
		PC-6.5. Ability to provide internal quality control and safety of medical activities within the scope of job responsibilities.

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*	Subsequent courses/modules*
UC-1	Being able to implement critical analysis of problem situations based on systems approach, develop an action strategy	Biochemistry; Anatomy; Philosophy; Psychology and Pedagogy; Mathematics; Hygiene; History of Medicine; Physics	Pathophysiology, clinical pathophysiology; Propaedeutics of internal diseases; Public health and healthcare, health economics; Epidemiology; Neurology, medical genetics, neurosurgery; Disaster medicine; Faculty therapy; Hospital therapy; Endocrinology; Infectious Diseases; Phthisiology; Anesthesiology, intensive care, intensive care; Allergology; Medical Enzymology
GPC-6	Being able to organize patient	Life safety	Propaedeutics of internal diseases;

	<p>care, provide primary health care, provide work organization and professional decision-making in case of emergency conditions at the pre-hospital stage, in emergency situations, epidemics and in foci</p>	<p>Practice: Introductory practice on obtaining primary professional skills: patient care (simulation center); Introductory practice on obtaining primary professional skills: patient care</p>	<p>General surgery; Topographic anatomy and operative surgery; Epidemiology; Disaster Medicine; Faculty therapy; Urology; Anesthesiology, intensive care, intensive care; Allergology; Endoscopic urology; Faculty Surgery</p> <p>Practice: Practice for obtaining primary professional skills: assistant to junior medical personnel; Practice on emergency medical manipulations (simulation center)</p>
PC-1	<p>Being able to provide medical care to the patient in emergency or emergency forms</p>	<p>Jurisprudence; Life safety; Biochemistry; Anatomy; Bioethics; History of medicine</p> <p>Practice: Introductory practice on obtaining primary professional skills: patient care (simulation center); Introductory practice on obtaining primary professional skills: patient care; Practice for obtaining primary professional skills: assistant to junior medical personnel; Practice of diagnostic profile: assistant ward nurse</p>	<p>Propaedeutics of internal diseases; General surgery; Dermatovenereology; Neurology, medical genetics, neurosurgery; Otorhinolaryngology; Forensic medicine; Disaster Medicine; Faculty Surgery; Urology; Occupational diseases; Hospital therapy; Endocrinology; Polyclinic therapy; Anesthesiology, intensive care, intensive care; Hospital surgery, pediatric surgery; Oncology, radiation therapy; Traumatology, orthopedics; Sectional course; Allergology; Endoscopic urology; Medical Enzymology; Ophthalmology</p>

			<p>Practice: Practice on emergency medical manipulations (simulation center); Practice for obtaining primary professional skills and professional experience: assistant to a procedural nurse; Practice of surgical profile: assistant surgeon; Practice of obstetric and gynecological profile: assistant gynecologist; Assistant physician of the therapeutic profile: assistant physician therapist; General medical practice: assistant to an outpatient clinic doctor; Practice of obstetric and gynecological profile: assistant obstetrician</p>
PC-5	Being to conduct and monitor the effectiveness of measures for the prevention and formation of a healthy lifestyle and sanitary and hygienic education of the population	Psychology and pedagogy; Biochemistry; Biology; Normal physiology; Microbiology, virology; Anatomy; Histology, embryology, cytology; Organization of special patient care	Pathophysiology, clinical pathophysiology; Hygiene; Propaedeutics of internal diseases; General surgery; Epidemiology; Dermatovenerology; Neurology, medical genetics, neurosurgery; Faculty Surgery; Occupational diseases; Hospital therapy; Infectious diseases; Phthisiology; Anesthesiology, intensive care, intensive care; Hospital surgery, pediatric surgery; Oncology, radiation therapy; Obstetrics and gynecology; Pediatrics;

			<p>Maxillofacial surgery; Allergology; Reproductive health; Introduction to Nutritionology; Molecular genetics in practical biology and medicine; Fundamentals of pathophysiology; Medical Enzymology; Fundamentals of integrative medicine; Outpatient cardiology; Pathological anatomy, clinical pathological anatomy; Ophthalmology; Polyclinic therapy; Evidence-based medicine; Forensic medicine;</p> <p>Practice: Practice of surgical profile: assistant surgeon; Practice of obstetric and gynecological profile: assistant gynecologist; Assistant physician of the therapeutic profile: assistant physician therapist; General medical practice: assistant to an outpatient clinic doctor; Practice of obstetric and gynecological profile: assistant obstetrician; General Medical practice: Assistant Pediatrician</p>
PC-6	Being to maintain medical records and organize the activities of the nursing staff at the disposal	Life safety Practice: Introductory practice on obtaining primary professional skills: patient care (simulation center);	Propaedeutics of internal diseases; Radiation diagnostics; General surgery; Topographic anatomy and operative surgery; Public health and healthcare, healthcare

		Introductory practice on obtaining primary professional skills: patient care; Practice for obtaining primary professional skills: assistant to junior medical personnel	economics; Epidemiology; Ophthalmology; Disaster Medicine; Faculty Surgery; Urology; Polyclinic therapy; Anesthesiology, intensive care, intensive care; Oncology, radiation therapy; Maxillofacial surgery; Allergology; Endoscopic urology Practice: Practice of surgical profile: assistant surgeon; General medical practice: assistant to an outpatient clinic doctor; Practice on emergency medical manipulations (simulation center)
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* To be filled in according to the competence matrix of the higher education programme.

4. COURSE WORKLOAD AND ACADEMIC ACTIVITIES

The total workload of the course "**Immunology**" is **2** credits (72 academic hours).

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

Type of academic activities	Total academic hours	Semesters/training modules
		3
Classroom learning , <i>ac.h.</i>	54	54
Lectures (LC)	18	18
Lab work (LW)	36	36
Seminars (workshops/tutorials) (S)	-	-
<i>Self-studies</i>	15	15
<i>Evaluation and assessment (exam/passing/failing grade)</i>	3	3
Course workload	academic hours_	72
	credits	2

* To be filled in regarding the higher education programme correspondence training mode.

5. COURSE CONTENTS

Table 5.1. Course contents and academic activities types

Course module title	Course module contents (topics)	Academic activities types
Module 1 Basic immunology	1.1. Introduction to immunology	LC, LW
	1.2. The structure of immune system	LC, LW
	1.3. Innate immunity	LC, LW
	1.4. Adaptive immunity	LC, LW
Module 2 Clinical immunology	2.1. Pathology of the immunity	LC, LW
	2.2. Immunodiagnosis, immunoprophylaxis, immunotherapy	LC, LW

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

6. CLASSROOM EQUIPMENT AND TECHNOLOGY SUPPORT REQUIREMENTS

Table 6.1. Classroom equipment and technology support requirements

Type of academic activities	Classroom equipment	Specialised educational / laboratory equipment, software, and materials for course study (if necessary)
Lecture	Conference room equipped with a set of specialized furniture and digital equipment;	Camera; Communication Station-HP Compaq Pro/Intel Pentium E6300 / 2.8GHZ / DDR3 1300 / HDD320Gb / DVD +/- RWPCI Express x 16/2*Ethernet 10SATA 3/5/1 st Hard Drive; Projector for conference rooms EIKI LC-XB43N; speaker system.
Lab work	Classroom for lab work, individual consultations, self-studies equipped with a set of specialized furniture; whiteboard.	PC (Core i5 9400 unit, BENQ GW2480 23.8 monitor, BENQ GW2480 23.8 monitor)
Lab work	Classroom for seminar classes, consultations, intermediate certification, equipped with a set of specialized furniture and digital equipment	PC (monitor 19" Acer, Intel i7 8700/MV unit (GIGABYTE Z370); HP LaserJet Pro M227fdn laser MFP; PC (system block, monitor, mouse)
Computer Lab	Computer class for seminar classes, consultations, intermediate certification, equipped with a set of specialized furniture, personal computers (3 un.) and digital equipment	PC (AOC monitor 19", system block i3 7100/MV Asus/4Gb/240Gb SSD); MFP laser HP LaserJet MFP M132nw EN white
Self-studies	Classroom for self-studies of	LCD panel with VBA port;

Type of academic activities	Classroom equipment	Specialised educational / laboratory equipment, software, and materials for course study (if necessary)
	students (can be used for seminars and consultations), equipped with a set of specialized furniture, computers with stable wireless Internet connection.	LED TV SUPRA 'STV-LC47660FL00

* The premises for students' self-studies are subject to **MANDATORY** mention

7. RESOURCES RECOMMENDED FOR COURSE STUDY

Main readings:

Hardcover:

1. Immunology: textbook / R. M. Khaitov. - 4th ed., reprint. and add. - Moscow: GEOTAR-Media, 2021. - 520 p. - ISBN 978-5-9704-6398-7.
2. R.I. Sepiashvili. Physiology of the immune system: monograph. M.: Medicine - Health, 2019. - 338 p.

Electronic sources:

1. Immunology [Electronic resource]: textbook / R. M. Khaitov. - 4th ed., reprint. and add. - Moscow: GEOTAR-Media, 2021. - 520 p. - ISBN 978-5-9704-6398-7. <https://www.studentlibrary.ru/book/ISBN9785970463987.html>
2. Immunology. [Electronic resource]: atlas / Khaitov R. M., Garib F. Yu. - Moscow: GETAR-Media, 2020. - 416 p. - ISBN 978-5-9704-5525-8. - <https://www.studentlibrary.ru/book/ISBN9785970455258.html>
3. Immunology [Electronic resource]: textbook / Yarilin A. A. - Moscow: GEOTAR-Media, 2010. - 752 p. - ISBN 978-5-9704-1319-7. - <https://www.studentlibrary.ru/book/ISBN9785970413197.html>

Additional readings:

Hardcover:

1. R.I. Sepiashvili, I.P. Balmasova M. Physiology of natural killers. Medicine-Health, 2005. – 456 p

Electronic sources:

1. Immunology: Structure and functions of the immune system / Khaitov R. M. - Moscow: GEOTAR-Media, 2019. - 328 p. - ISBN 978-5-9704-4962-2. - <https://www.studentlibrary.ru/book/ISBN9785970449622.html>
2. Allergology and clinical immunology / edited by R. M. Khaitov, N. I. Ilyina - Moscow: GEOTAR-Media, 2019. - 336 p. (Series "Clinical Recommendations") - ISBN 978-5-9704-5010-9. <https://www.studentlibrary.ru/book/ISBN9785970450109.html>
3. Basic immunology with the basics of clinical immunology: textbook. manual / A.V. Moskalev, V. B. Sboyshakov, A. S. Rudoy. - Moscow: GEOTAR-Media, 2015. - 352 p. - ISBN 978-5-9704-3382-9. <https://www.studentlibrary.ru/book/ISBN9785970433829.html>

4. Microbiology, virology, immunology of the oral cavity: textbook / edited by V. N. Tsarev. - 2nd ed., reprint. and add. - Moscow: GEOTAR-Media, 2021. - 720 p. - ISBN 978-5-9704-6260-7. –
<https://www.studentlibrary.ru/book/ISBN9785970462607.html>

Internet (based) sources:

1. Electronic libraries with access for RUDN students:
 - Electronic library network of RUDN – ELN RUDN
<http://lib.rudn.ru/MegaPro/Web>
 - ELN «University Library online» <http://www.biblioclub.ru>
 - ELN Urait <http://www.biblio-online.ru>
 - ELN «Student Advisor» www.studentlibrary.ru
 - ELN «Lan» <http://e.lanbook.com/>
2. Databases and search engines:
 - Database elibrary.ru - scientific electronic library. The link:
<http://elibrary.ru/defaultx.asp/>
 - Electronic libraries with access for RUDN students. The link:
<http://lib.rudn.ru/MegaPro/Web/>
 - Electronic library of the medical university. The link:
<http://www.studmedlib.ru/>
 - National Center for Biotechnological Information. The link:
<https://www.ncbi.nlm.nih.gov/>
 - *Training toolkit for self- studies to master the course* *:
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 - 1. The set of lectures on the course "Immunology".
 - 2. The laboratory workshop (if any) on the course "Immunology".
 - 3. The guidelines for writing a course paper / project (if any) on the course "Immunology".
 - 4.
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 - * The training toolkit for self- studies to master the course is placed on the course page in the university telecommunication training and information system under the set procedure.

8. ASSESSMENT TOOLKIT AND GRADING SYSTEM* FOR EVALUATION OF STUDENTS' COMPETENCES LEVEL UPON COURSE COMPLETION

The assessment toolkit and the grading system* to evaluate the competences formation level (GC-1, GPC-6, PC-1, PC-5, PC-6) upon the course study completion are specified in the Appendix to the course syllabus.

* The assessment toolkit and the grading system are formed on the basis of the requirements of the relevant local normative act of RUDN University (regulations / order).

DEVELOPERS:

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department

position, department



signature

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name and surname

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