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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**

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

**COURSE SYLLABUS**

**IMMUNOLOGY, CLINICAL IMMUNOLOGY**

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course title

**Recommended by the Didactic Council for the Education Field of:**

**31.05.03 Dentistry**

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field of studies / speciality code and title

**The course instruction is implemented within the professional education programme  
of higher education:**

**Dentistry**

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higher education programme profile/specialisation title

## 1. COURSE GOAL(s)

The course is intended 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.

## 2. REQUIREMENTS FOR LEARNING OUTCOMES

Mastering the course (module) «**Immunology, clinical immunology**» is aimed at the development of the following competences /competences in part: UC-1, GPC-6, PC-1, PC-6,PC-7

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

| Competence code | Competence descriptor                                                                                                  | Competence formation indicators (within this course)                                                                                                                                                                                                                                                                        |
|-----------------|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| UC-1            | Being able to implement critical analysis of problem situations based on systems approach, develop an action strategy. | UC-1.1. Analysing the problem situation as a system identifying its components and links between them.                                                                                                                                                                                                                      |
|                 |                                                                                                                        | UC-1.2. Defining gaps in the information required to deal with a problem situation and designing processes to address them.                                                                                                                                                                                                 |
|                 |                                                                                                                        | UC-1.3. Assessing in a critical way the reliability of information sources; working with contradictory information from different sources.                                                                                                                                                                                  |
|                 |                                                                                                                        | UC-1.4. Developing and giving meaningful reasons for and against a strategy for solving a problem situation in terms of a systematic and interdisciplinary approaches.                                                                                                                                                      |
|                 |                                                                                                                        | UC-1.5. Using logical and methodological tools for critical assessment of the modern concepts of a philosophical and social nature in the relevant field of study.                                                                                                                                                          |
| GPC-6           | Being able to prescribe non-drug and drug treatment, monitor its efficacy and safety when solving professional tasks   | GPC-6.1. Developing a plan for dental disease treatment taking into account the diagnosis, age and clinical picture in accordance with the current procedures for the provision of medical care, clinical guidelines (treatment protocols) on the provision of medical care taking into account the medical care standards. |
|                 |                                                                                                                        | GPC-6.2. Selecting medical products (including dental materials) for drawing up a comprehensive plan for dental disease treatment. Following up the treatment of a patient.                                                                                                                                                 |
|                 |                                                                                                                        | GPC-6.3. Assessing the possible side effects of taking medicinal drugs.                                                                                                                                                                                                                                                     |

| Competence code | Competence descriptor                                                             | Competence formation indicators (within this course)                                                                                                                                                                                                                                                                        |
|-----------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                 |                                                                                   | GPC-6.4. Providing medical care to a dental patient in emergency or urgent forms.                                                                                                                                                                                                                                           |
|                 |                                                                                   | GPC-6.5. Organizing the prevention and treatment of complications, side effects, undesirable reactions, including the unforeseen ones, which can arise from diagnostic or medicinal manipulations, use of drugs and (or) medical devices, non-drug treatment at a dental appointment.                                       |
|                 |                                                                                   | GPC-6.6. Organizing personalized treatment of a dental patient, including elderly and senile patients, pregnant women, children with somatic pathologies; evaluating the efficacy and safety of treatment.                                                                                                                  |
|                 |                                                                                   | GPC-6.7. Prescribing medicinal drugs, medical devices, taking into account the diagnosis, age and clinical picture, and in accordance with the current procedures for the provision of medical care, clinical guidelines (treatment protocols) on the provision of medical care taking into account medical care standards. |
|                 |                                                                                   | GPC-6.8. Prescribing non-drug treatment taking into account the diagnosis, age and disease pattern in accordance with the current procedures for the provision of medical care, clinical guidelines (treatment protocols) on the provision of medical care taking into account the medical care standards.                  |
|                 |                                                                                   | GPC-6.9. Evaluating the efficacy and safety of using medicinal drugs, medical devices and other methods of treatment at a dental appointment.                                                                                                                                                                               |
| PC-1            | Being able to make an examination of a patient in order to determine a diagnosis. | PC-1.1. Making an initial examination and/or reexamination of a patient in order to make a preliminary diagnosis.                                                                                                                                                                                                           |
|                 |                                                                                   | PC-1.2. Receiving information from patients (their relatives/legal representatives); conducting a questionnaire survey of patients regarding their general health status; identifying concomitant diseases in order to make a preliminary diagnosis.                                                                        |
|                 |                                                                                   | PC-1.3. Detecting if patients have dentoalveolar, facial anomalies, deformities and prerequisites for their development, defects in the crowns of teeth and dentition on the basis of the patient examination; laboratory,                                                                                                  |

| Competence code | Competence descriptor                                                                                                                                                                                        | Competence formation indicators (within this course)                                                                                                                                                                                                                  |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                 |                                                                                                                                                                                                              | instrumental, and additional examinations in order to make a preliminary/final diagnosis.                                                                                                                                                                             |
|                 |                                                                                                                                                                                                              | PC-1.4. Detecting if patients have risk factors for oncopathology (including various background processes, precancerous conditions) based on laboratory, instrumental and additional examinations in order to make a preliminary/final diagnosis.                     |
|                 |                                                                                                                                                                                                              | PC-1.5. Making a preliminary/final diagnosis based on the patient examination; laboratory and instrumental examinations.                                                                                                                                              |
|                 |                                                                                                                                                                                                              | PC-1.6. Making a final diagnosis based on additional examinations of patients.                                                                                                                                                                                        |
| PC-6            | Being able to analyze and present in public medical information based on evidence-based medicine, participate in scientific research, introduce new methods and techniques aimed at protecting public health | PC-6.1. Searching for medical information based on evidence-based medicine, interpreting data from scientific publications and/or preparing a presentation to make medical information, the results of scientific research public.                                    |
|                 |                                                                                                                                                                                                              | PC-6.2. Developing algorithms for the examination and treatment of adults and children with dental diseases in accordance with the principles of evidence-based medicine, as well as searching and interpreting medical information based on evidence-based medicine. |
|                 |                                                                                                                                                                                                              | PC-6.3. Conducting public presentation of medical information based on evidence-based medicine/ partial participation in scientific research.                                                                                                                         |
| PC-7            | Being able to conduct organizational and managerial activity.                                                                                                                                                | PC-7.1. Keeping medical documentation.                                                                                                                                                                                                                                |
|                 |                                                                                                                                                                                                              | PC-7.2. Organizing management of medical workers holding positions of paramedic and junior medical staff, quality control over implementing/providing medical care, and medical prescriptions.                                                                        |
|                 |                                                                                                                                                                                                              | PC-7.3. Making examinations of temporary disability of patients, incapacity for work due to caring for a sick child, determination of medical indications for employment, transfer to easier working conditions, sanatorium treatment.                                |
|                 |                                                                                                                                                                                                              | PC-7.4. Analyzing and providing the main medical and statistical indicators (morbidity, disability, mortality, lethality) of the population of the service area in the prescribed manner.                                                                             |
|                 |                                                                                                                                                                                                              | PC-7.5. Drawing up a work plan and a report                                                                                                                                                                                                                           |

| Competence code | Competence descriptor | Competence formation indicators (within this course) |
|-----------------|-----------------------|------------------------------------------------------|
|                 |                       | on their work.                                       |

### 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. | Mathematics;<br>Physics;<br>Human Anatomy;<br>Philosophy;<br>History of medicine;<br>Bioelements in Medicine;<br>Medical Elementology;<br>Chemistry of Biogenic Elements;<br>Dental Modeling of Teeth; | Pathophysiology -<br>Pathophysiology of Head and Neck;<br>Otorhinolaryngology;<br>Obstetrics;<br>Gnathology and Temporomandibular Joint's Functional Diagnostics;<br>Prosthodontics (Simple Prosthetics);<br>Prosthodontics of Edentulous Patient;<br>Prosthodontics (Complex Prosthetics);<br>Pediatric Maxillofacial Dentistry;<br>Maxillofacial Prosthodontics;<br>Pediatric Dentistry;<br>Orthodontics and Pediatric Prosthodontics;<br>Medical Genetics in Dentistry;<br>Medical Rehabilitation;<br>Observing and Assisting a Dentist (Operative Dentistry and Endodontics);<br>Observing and Assisting a Dentist (Prosthodontics); |
| GPC-6           | Being able to prescribe non-drug and drug treatment, monitor its efficacy and safety when                              | Basic Military Training. Life Safety;<br>Science of Dental Materials;                                                                                                                                  | Pharmacology;<br>Internal Medicine;<br>Clinical Pharmacology;<br>General Surgery;<br>Surgical Diseases;<br>Health and Safety;<br>Dermatovenerology;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

|      |                                                                                   |                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|------|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      | solving professional tasks                                                        |                                                                                                                                            | Neurology;<br>Psychiatry and Narcology;<br>Pediatrics;<br>Operative Dentistry: Cariology and Hard Tissues Diseases;<br>Endodontics;<br>Gerodontics and Oral Mucosa Diseases;<br>Periodontology;<br>Oral Surgery;<br>Gnathology and Temporo-Mandibular Joint's Functional Diagnostics;<br>Prosthodontics (Simple Prosthetics);<br>Prosthodontics of Edentulous Patient;<br>Prosthodontics (Complex Prosthetics);<br>Maxillofacial and Orthognathic Surgery;<br>Head and Neck Diseases;<br>Pediatric Maxillofacial Dentistry;<br>Maxillofacial Prosthodontics;<br>Pediatric Dentistry;<br>Orthodontics and Pediatric Prosthodontics;<br>Medical Genetics in Dentistry;<br>Medical Rehabilitation;<br>Clinical Dentistry;<br>Implantology and Reconstructive Surgery;<br>Modern Endodontics;<br>Emergency Conditions in Outpatient Dentistry Practice |
| PC-1 | Being able to make an examination of a patient in order to determine a diagnosis. | Basic Military Training. Life Safety;<br>Propaedeutics of Dental Diseases;<br>Chemistry of Biogenic Elements;<br>Dental Modeling of Teeth; | Otorhinolaryngology;<br>Obstetrics;<br>Operative Dentistry: Cariology and Hard Tissues Diseases;<br>Endodontics;<br>Gerodontics and Oral Mucosa Diseases;<br>Periodontology;<br>Local Anesthesia and Anesthesiology in Dentistry;<br>Oral Surgery;<br>Gnathology and Temporo-                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

|  |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|--|--|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  |  |  | Mandibular Joint's Functional<br>Diagnostics;<br>Prosthodontics (Simple<br>Prosthetics);<br>Prosthodontics of Edentulous<br>Patient;<br>Prosthodontics (Complex<br>Prosthetics);<br>Maxillofacial and Orthognathic<br>Surgery;<br>Head and Neck Diseases;<br>Pediatric Maxillofacial Dentistry;<br>Maxillofacial Prosthodontics;<br>Pediatric Dentistry;<br>Orthodontics and Pediatric;<br>Prosthodontics;<br>Medical Genetics in Dentistry;<br>Medical Rehabilitation;<br>Implantology and Reconstructive<br>Surgery;<br>Modern Endodontics;<br>Aesthetic Restoration;<br>Observing and Assisting a Dentist<br>(Oral Surgery);<br>Observing and Assisting a Dentist<br>(Operative Dentistry and<br>Endodontics);<br>Observing and Assisting a Dentist<br>(Prosthodontics);<br>Observing and Assisting a Dentist<br>(Pediatric);<br>Observing and Assisting a Dentist<br>(General Dentistry), Including<br>Research Practice;<br>Cone Beam Computed<br>Tomography in the<br>Diagnosis Planning and<br>Evaluation of the<br>Effectiveness of Dental Solutions;<br>Dental Oncology and<br>Radiotherapy;<br>Pathophysiology -<br>Pathophysiology of Head and<br>Neck;<br>Pathologic Anatomy - Pathologic<br>Anatomy of Head<br>and Neck;<br>Modern Endodontics; |
|--|--|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|      |                                                                                                                                                                                                              |                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      |                                                                                                                                                                                                              |                                   | Aesthetic Restoration;                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| PC-6 | Being able to analyze and present in public medical information based on evidence-based medicine, participate in scientific research, introduce new methods and techniques aimed at protecting public health |                                   | Pharmacology;<br>Ophthalmology;<br>Gnathology and Temporomandibular Joint's Functional Diagnostics;<br>Prosthodontics (Simple Prosthetics);<br>Prosthodontics of Edentulous Patient;<br>Prosthodontics (Complex Prosthetics);<br>Pediatric Maxillofacial Dentistry;<br>Maxillofacial Prosthodontics;<br>Medical Genetics in Dentistry;<br>Observing and Assisting a Dentist (General Dentistry), Including Research Practice;<br>Clinical Trials;<br>Clinical Dentistry;<br>Evidence-based Medicine; |
| PC-7 | Being able to conduct organizational and managerial activity.                                                                                                                                                | Propaedeutics of Dental Diseases; | Public Health and Healthcare;                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

\* 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, clinical immunology**" is **2** credits (72 academic hours)

*Table 4.1. Types of academic activities during the period of the HE program mastering*

| Type of academic activities                                   |                | Total academic hours | Semesters/training modules |
|---------------------------------------------------------------|----------------|----------------------|----------------------------|
|                                                               |                |                      | <b>4</b>                   |
| Classroom learning , <i>ac.h.</i>                             |                | <b>54</b>            | <b>54</b>                  |
| Lectures (LC)                                                 |                | <b>18</b>            | <b>18</b>                  |
| Lab work (LW)                                                 |                | <b>36</b>            | <b>36</b>                  |
| Seminars (workshops/tutorials) (S)                            |                | -                    | -                          |
| <i>Self-studies</i>                                           |                | <i>12</i>            | <i>12</i>                  |
| <i>Evaluation and assessment (exam/passing/failing grade)</i> |                | <i>6</i>             | <i>6</i>                   |
| <b>Total course workload</b>                                  | academic hours | <b>72</b>            | <b>72</b>                  |
|                                                               | credits        | <b>2</b>             | <b>2</b>                   |

## 5. COURSE CONTENTS

*Table 5.1. Course contents and academic activities types*

| Course module title                 | Course module contents (topics)                                                                                                                                                                                                                                                                                             | Academic activities types |
|-------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
| <b>Module 1</b><br>Basic immunology | <b>1.1.</b> Introduction to Immunology. Subject and objectives of immunology. The concept of immunity. Theories of immunity. History of immunology development.                                                                                                                                                             | <b>LC, LW</b>             |
|                                     | <b>1.2.</b> Structure and functions of the human immune system, its age-related features. Ontogeny and phylogeny of the immune system. Central and peripheral organs. Immunopoiesis. Stem cells, mechanisms of their proliferation and differentiation. Types of immunity.                                                  | <b>LC, LW</b>             |
|                                     | <b>1.3.</b> Mechanisms of innate immunity. Pattern recognition receptors. Toll-like receptor signaling pathways.                                                                                                                                                                                                            | <b>LC, LW</b>             |
|                                     | <b>1.4.</b> Myeloid-derived innate immune cells. Phagocytosis. Types of phagocytosis. Killing and degradation of phagocytosed material. Consequences of phagocytosis. Lymphoid components of innate immunity: Natural killer (NK) cells, innate lymphoid cells. Cells with properties of both innate and adaptive immunity. | <b>LC, LW</b>             |
|                                     | <b>1.5.</b> Humoral factors of innate immunity. Complement system. Endogenous antimicrobial peptides and proteins - natural antibiotics. Interferons.                                                                                                                                                                       | <b>LC, LW</b>             |
|                                     | <b>1.6.</b> Cell interactions during immune response. Cell adhesion molecules. Cytokines. Chemokines. Cytokine and chemokine receptors. Immune cell homing.                                                                                                                                                                 | <b>LC, LW</b>             |
|                                     | <b>1.7.</b> Human leukocyte antigen (HLA) system. Gene structure and functions of HLA class I and II molecules. Antigen-presenting cells. Antigen processing and presentation.                                                                                                                                              | <b>LC, LW</b>             |
|                                     | <b>1.8.</b> Antigens and Antibodies. Structure and main properties of antigens. Types of antigens. Structure and function of immunoglobulins of different classes. Antibody class switching mechanisms. Antigen-antibody interaction mechanisms.                                                                            | <b>LC, LW</b>             |
|                                     | <b>1.9.</b> T and B Lymphocytes. T and B lymphocyte subpopulations. Maturation and                                                                                                                                                                                                                                          | <b>LC, LW</b>             |

| Course module title                                                  | Course module contents (topics)                                                                                                                                                                                                                                                                            | Academic activities types |
|----------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
|                                                                      | differentiation. Structure of T-cell and B-cell receptors.                                                                                                                                                                                                                                                 |                           |
|                                                                      | <b>1.10.</b> Immune Response. Stages of immune response development. Factors determining different types of immune responses. Effector mechanisms of immunity. Mucosal immunity. Immune regulation of oral resident microbiota.                                                                            | <b>LC, LW</b>             |
|                                                                      | <b>1.11.</b> Immune system inhibition. Apoptosis. Immune response suppression. Lymphocyte suppression. Leukocyte suppression. Immune tolerance. Transplantation. Immune-privileged tissues.                                                                                                                | <b>LC, LW</b>             |
| <b>Module 2</b><br>Clinical immunology                               | <b>2.1.</b> Immune System Pathology. Classification of immunopathological reactions by Gell and Coombs. Development mechanisms of different types of immunopathological reactions.                                                                                                                         | <b>LC, LW</b>             |
|                                                                      | <b>2.2.</b> Allergy. Allergens. Types of hypersensitivity reactions. Regulation of IgE synthesis and secretion. Mast cells and their role in allergic reactions. Mediators of immediate hypersensitivity. Principles of allergy diagnosis and treatment. Allergic diseases of the oral cavity.             | <b>LC, LW</b>             |
|                                                                      | <b>2.3.</b> Autoimmune Diseases. Etiology and immunopathogenesis. Organ-specific autoimmune diseases. Systemic autoimmune diseases. Principles of autoimmune disease diagnosis and treatment. Oral manifestations of autoimmune diseases.                                                                  | <b>LC, LW</b>             |
|                                                                      | <b>2.4.</b> Primary Immunodeficiencies. Classification. General clinical features of primary immunodeficiencies. Diagnostic and treatment principles for primary immunodeficiencies. Oral manifestations in primary immunodeficiencies. Secondary immunodeficiency and acquired immunodeficiency syndrome. | <b>LC, LW</b>             |
|                                                                      | <b>2.5.</b> Antitumor Immunity. Tumor-associated antigens. Effector mechanisms of antitumor immunity. Tumor immune evasion mechanisms. Tumors of the immune system.                                                                                                                                        | <b>LC, LW</b>             |
| <b>Module 3</b><br>Immunodiagnosis, immunoprophylaxis, immunotherapy | <b>3.1.</b> Human Immune System Evaluation. Immunobiotechnology: monoclonal antibodies and hybridoma technology.                                                                                                                                                                                           | <b>LC, LW</b>             |
|                                                                      | <b>3.2.</b> Vaccines. Vaccine prophylaxis and                                                                                                                                                                                                                                                              | <b>LC, LW</b>             |

| Course module title | Course module contents (topics)                                            | Academic activities types |
|---------------------|----------------------------------------------------------------------------|---------------------------|
|                     | vaccine therapy. Basic principles of immunotherapy and vaccine prevention. |                           |

## 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)                                                                                                                           |
|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Conference room             | 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 #1                 | 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 #2                 | 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 students (can be used for seminars and consultations), equipped with a set of specialized furniture, computers with stable wireless Internet connection. | LCD panel with VBA port; LED TV SUPRA 'STV-LC47660FL00                                                                                                                                                                            |

## 7. RESOURCES RECOMMENDED FOR COURSE STUDY

*Main readings:*

**Electronic sources:**

1. Immunology: textbook / R.M. Khaitov ; Khaitov R.M. - Moscow: GEOTAR-Media, 2021. - 272 p. - ISBN 978-5-9704-5861-7. -

[https://mega.rudn.ru/MegaPro/UserEntry?Action=Link\\_FindDoc&id=518581&idb=0](https://mega.rudn.ru/MegaPro/UserEntry?Action=Link_FindDoc&id=518581&idb=0)

*Additional reading:*

**Electronic sources:**

1. Immunology: textbook / Rakhim M. Khaitov. - 2nd updated edition. - Moscow : GEOTAR-Media, 2022. - 272 c. - ISBN 978-5-9704-7089-3. -

<https://www.studentlibrary.ru/book/ISBN9785970470893.html>

2. Medical Microbiology, Virology, Immunology : textbook : in 2 volumes. Vol. 1 / eds. V. V. Zverev, M. N. Boichenko. - Moscow : GEOTARMedia, 2022. - 384 c. - ISBN 978-5-9704-7072-5. -

<https://www.studentlibrary.ru/book/ISBN9785970470725.html>

3. Medical Microbiology, Virology, Immunology : textbook : Vol. 2. / eds. V. V. Zverev, M. N. Boichenko. - Москва : ГЭОТАР-Медиа, 2020. - 392 c. - ISBN 978-5-9704-5719-1. -

<https://www.studentlibrary.ru/book/ISBN9785970457191.html>

4. The Washington Manual Allergy, Asthma, and Immunology Subspecialty Consult / Edited by Andrew L. Kau, Jennifer M. Monroy, Brooke I. Polk, and Christopher J. Rigell; executive editor, Thomas Ciesielski. - Wolters Kluwer Health, 2022. - 411 c. - (Washington manual subspecialty consult series). - ISBN 9781975113261. -

[https://mega.rudn.ru:443/MegaPro/UserEntry?Action=Rudn\\_FindDoc&id=513346&idb=0](https://mega.rudn.ru:443/MegaPro/UserEntry?Action=Rudn_FindDoc&id=513346&idb=0)

**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](http://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/>

*Learning toolkits for self-studies during the development of the discipline*

1. Lectures Synopsis on the discipline "Immunology, clinical immunology".
  2. Methodological guidelines for the implementation and execution of control and independent work on the discipline "Immunology, clinical immunology"
- \* - All teaching materials for self-studying of students are placed in accordance with the current procedure on the discipline page in the RUDN LMS TUIS.

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

Evaluation materials and point-rating system\* for assessing the level of competence formation (UC-1, GPC-6, PC-1, PC-6, PC-7) based on the results of mastering the discipline «Immunology, clinical immunology» are presented in the Appendix to this Work Program of the discipline.

\* 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:**

Professor of the Immunology  
department

position, educational department

E. A. Levkova

signature

name and surname

Professor of the Immunology  
department

position, educational department

Al. D. Donetskova

signature

name and surname

### **HEAD OF EDUCATIONAL DEPARTMENT:**

Head of the Department of  
Immunology

position, educational department

Ol. G. Elisyutina

signature

name and surname

### **HEAD OF HIGHER EDUCATION PROGRAMME:**

Head of the Department of  
Propaedeutics of Dental  
Diseases

position, educational department

S.N. Razumova

signature

name and surname