

**SYLABUS**

Concerning the cycle of education **2024-2030**  
Academic year 2025/2026

**1. BASIC COURSE/MODULE INFORMATION**

Course/Module title	<b>Basic Immunology</b>
Course/Module code *	<b>Im / C</b>
Faculty (name of the unit offering the field of study)	<b>Faculty of Medicine, University of Rzeszow</b>
Name of the unit running the course	<b>Department of Human Immunology, Faculty of Medicine, University of Rzeszow</b>
Field of study	<b>Medicine</b>
Qualification level	<b>Uniform Master's Degree Studies</b>
Profile	<b>General academic</b>
Study mode	<b>Stationary / non-stationary</b>
Year and semester of studies	<b>Year II, semester IV</b>
Course type	<b>Obligatory</b>
Language of instruction	<b>English</b>
Coordinator	<b>Prof. Jacek Tabarkiewicz</b>
Course instructor	<b>Prof. Jacek Tabarkiewicz M.D., Ph.D., Edyta Kopera PhD, Oliwia Dąbrowska MD</b>

\* - as agreed at the faculty

**1.1. Learning format – number of hours and ECTS credits**

Semester (no.)	Lectures	Classes	Laboratories	Seminars	Practical classes	Internships	others	ECTS credits
IV	10	-	15	20		-	-	4

**1.2. Course delivery methods**

X conducted in a traditional way

x involving distance education methods and techniques

**1.3. Course/Module assessment** (exam, pass with a grade, pass without a grade)

Exam

## 2. PREREQUISITES

Knowledge of biology at an advanced level
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## 3. OBJECTIVES, LEARNING OUTCOMES, COURSE CONTENT, AND INSTRUCTIONAL METHODS

### 3.1. Course/Module objectives

O1	Understanding the role and action of the immune system, factors regulating this system and pathogenesis and diagnostics of immune disorders and the pathomechanisms of immune-mediated diseases
O2	The ability to use immunoassay methods and the principles of selecting tests to determine the patient's immune status

### 3.2. COURSE/MODULE LEARNING OUTCOMES (TO BE COMPLETED BY THE COORDINATOR)

Learning Outcome	The description of the learning outcome defined for the course/module	Relation to the degree programme outcomes
LO_01	knows and understands the specific and non-specific mechanisms of humoral and cellular immunity;	C.W18
LO_02	knows and understands the major histocompatibility complex;	C.W19
LO_03	knows and understands the types of hypersensitivity reactions, types of immunodeficiencies and the basics of immunomodulation;	C.W20
LO_04	knows and understands issues in the field of immunology of tumors and immune-mediated diseases and the principles of immunotherapy;	C.W21
LO_05	knows and understands the molecular basis of neoplastic diseases and issues in the field of tumor immunology;	C.W42
LO_06	knows and understands the practical elements of molecular biology and immunology used in the diagnosis and therapy of oncological diseases.	C.W43
LO_07	link images of tissue and organ damage with clinical symptoms of the disease, history and laboratory tests' results in order to establish a diagnosis in the most common diseases of adults and children;	C.U7

### 3.3. Course content (to be completed by the coordinator)

#### A. Lectures

Content outline
1. Introduction to issues related to immunology, short history of immunology, development of the immune system
2. Inflammation. Complement system
3. Regulation of immune response, immunological tolerance and immunomodulation
4. Interactions of the immune system with other elements of the human body
5. Hypersensitivity
6. Autoimmunity
7. Immunodiagnostics, practical examples

#### B. Classes, laboratories, seminars, practical classes

Content outline
<b>Seminars</b>
1. Introduction to immunology. Anatomical structures of the immune system. Basic components and characteristics of the immune response. Specific issues: central and peripheral lymphatic organs (structure and function), basic components and essential features of the immune response, receptors recognizing patterns, specific and nonspecific mechanisms of the immune response, types of immune response (cellular and humoral response), immune response stages, phagocytosis and mechanisms cytotoxicity of phagocytic cells, adhesion molecules, diapedesis and leukocyte circulation.
2. A specific immune response. MHC system. An immunological synapse. Cellular immunity. Specific issues: MHC system, the concept of antigen, antigen presenting cells, maturation of T, NK and NKT lymphocytes, positive and negative selection in thymus, MHC restriction, antigen presentation to T lymphocytes, activation of T lymphocytes, TCR, lymphocyte cytotoxicity mechanisms, immunological memory.
3. A specific humoral immune response. Specific issues: Humoral immune response, B cells maturation, positive and negative selection of B cells, B cell activation, B cell immunoglobulin receptors, immunoglobulins: structure, class, function, immunoglobulin class switching phenomenon, regulation of antibody production and memory B-lymphocytes, interactions between humoral and cellular immune response.
4. Cytokines and their receptors. Specific issues: basic features and properties of cytokines, cytokine receptors and signaling pathways, interleukins, hematopoietic factors and other growth factors, interferons, superfamily of TNF

molecules, chemokines, use of cytokines and their receptors in medicine
5. Immune system in mucous membranes and skin. Immune response to infectious pathogen. Specific issues: MALT, GALT, immunity in respiratory and reproductive tract, oral tolerance, cells of the skin's immune system, characteristics and differences in the immune response against bacteria, viruses, parasites and fungi. Immunotherapy and vaccination.
<b>Labs</b>
1. Cells of the immune system. Non-specific immune response. phagocytosis
2. CD molecules (cluster of differentiation). Cytometric evaluation of phagocytosis and oxygen burst
3. Subpopulations and role of T lymphocytes, NK and NKT cells. Cytotoxic response
4. Immunophenotyping of T, NK, NKT cells subpopulations
5. B lymphocytes. Antibodies. Monoclonal antibodies
6. Methods for assessing maturity and function of B lymphocytes
7. Primary immune deficiencies
8. Analysis of the results of tests of patients with primary immune deficiencies
9. Secondary immune deficiencies
10. Application of immunology in modern medicine: scientific research, diagnostics, therapy

### 3.4. Methods of Instruction

Lecture: lecture with multimedia presentation, transfer of in-depth scientific knowledge in the field of immunology.

Seminar: Analysis of texts with discussion; Discussion on the application of acquired information from the field of immunology in understanding the pathogenesis of human diseases, diagnostics and therapy of human diseases.

Exercises: Independent performance of experiments by the student, planning of experiments, formulation and analysis of research problems, work with databases, development and analysis of research results.

## 4. ASSESSMENT TECHNIQUES AND CRITERIA

### 4.1 Methods of evaluating learning outcomes

Learning outcome	Methods of assessment of learning outcomes (e.g. test, oral exam, written exam, project, report, observation during classes)	Learning format (lectures, classes,...)
LO-01		
LO-02		

## 4.2 Course assessment criteria

Specific issues:

Laboratory:

Each student must complete all exercises. Exercises are performed by all students. Each task is performed in groups of 2-3 students. It is necessary to pass: correct performance of practical tasks and demonstrating a sufficient level of theoretical knowledge related to the subject of the exercises.

- in the case of unexcused absence, the exercise should perform laboratory class with another group
- in the case of excused absence and the inability to take up classes with another group, the theoretical part should be pass during teacher's consultation hours. The student shall do this in TWO approaches until to the next classes (if not student is not allowed to participate in next classes).
- absences due to holidays should be pass during teacher's consultation hours. The student shall do this in TWO approaches
- in the case of unauthorized absences, the student is NOT admitted to the exam session.
- at EACH laboratory classes, teachers are required to asses knowledge and skills of ALL students on the negative / positive / „outstanding“ rating scale.
- positive passing of all laboratory class is NECESSARY to be allowed to take final test.
- in the case of a negative assessment of the student's knowledge by the teacher, the theoretical part should be pass during teacher's consultation hours. The student shall do this in TWO approaches until to the next classes (if not student is not allowed to participate in next classes).
- the teacher, due to too many students in classes, has the right to not allow students making up classes to participate in classes with another group.
- laboratory footwear and white coat must be used during laboratory classes, outerwear should be left in the cloakroom
- on the first exercises, students confirm that they have been acquainted with the abovementioned rules and received answers to all their questions about the rules in laboratory rooms
- the final grade from the laboratory classes is the grade from the final test

SEMINARS

- in the case of unexcused absence, the exercise should perform seminar with another group

- in the case of excused absence and the inability to take up classes with another group, the theoretical part should be pass during teacher's consultation hours. The student shall do this in TWO approaches until to the next classes (if not student is not allowed to participate in next classes).
- absences due to holidays should be pass during teacher's consultation hours. The student shall do this in TWO approaches
- in the case of unauthorized absences, the student is NOT admitted to the exam session.
- at EACH seminar, teachers are required to asses knowledge and skills of ALL students on the negative / positive / „outstanding“ rating scale.
- positive passing of all seminars is NECESSARY to be allowed to take final test.
- in the case of a negative assessment of the student's knowledge by the teacher, the theoretical part should be pass during teacher's consultation hours. The student shall do this in TWO approaches until to the next classes (if not student is not allowed to participate in next classes).
- the teacher, due to too many students in classes, has the right to not allow students making up classes to participate in classes with another group.
- outerwear should be left in the cloakroom
- at the first seminar, students confirm that they have been acquainted with the abovementioned rules and received answers to all their questions about the rules.
- the final grade from the seminars is the grade from the final test

## LECTURES

- attendance at lectures is obligatory

## FINAL TEST.

- The test lasts 90 minutes from the start of the answering - all students in the room took their places, the teacher presented the applicable rules, resolved all doubts and answered all questions of students participating in the exam, the student representative confirmed by signature that the students taking part in the exam had the opportunity to familiarize themselves with the rules and obtained answers to all questions. The test will be performed in traditional way (printed questionnaire) or with the use of electronic platforms and computers located in rooms of UR.
- The test consists of 100 multiple (4) choice questions with one correct answer.
- positive completion of ALL exercises and seminars is NECESSARY to take the final test.
- Students leave all handbags, bags etc. in the room in a specially designated place. During the final test, the student may only carry writing implements, drinking water. Mobile phones must be turned off.

- Any attempt to communicate between students and cheating result immediate stopping of test for cheating students and negative (2.0) grade
  - Any attempt to use electronic devices including a mobile phone will be treated as cheating.
  - Students remain in place (even if they finish answering test earlier) until the final test is completed by all students.
  - Any comments on the test, including the correctness of the questions, may be raised only during the test by raising the hand and describing problems on the sheet given by teacher. The result of the analysis of comments considering test will be given to student via Virtual University portal or in person. If the substantive error in the question is confirmed, the question is canceled and the percentages listed below are calculated in relation to the new number of questions.
  - An unexcused absence from the final test results in a negative (2.0) grade.
  - Absence from the final test can only be excused by the rector's / dean's or medical certificate submitted within 3 days from the final test day to the Dean's Office and the Human Immunology Department. Failure to submit the certificate within this period will result in negative assessment.
  - The possibility of taking the final test before exam session will be considered individually, for students who obtained min. 6 overall „outstanding“ scores from exercises and seminars. The results of the "early term" is counted as the final grade. IT IS NOT POSSIBLE TO RETAKE FINAL TEST IF THE GRADE WAS POSITIVE ( $\geq 3.0$ ).
  - Students who demonstrate outstanding (at least 8 distinguishing marks) achievements during the classes will be eligible for a bonus (+0.5) added to the final exam grade. In order to receive the bonus beyond the 8 distinguishing marks, it will be necessary to prepare a presentation of a clinical case. The bonus will be added to the final score based on the number of points obtained from the test. If the student receives a negative grade (2.0), the bonus does not increase the grade to a satisfactory grade (3.0) and it is not possible to convert the bonus into an additional point/s. If student receives negative grade in the first term and a positive grade in the retake exam, the bonus would be added to the grade resulting from the scores obtained in the retake.
  - Grading scale:
- 5.0 - 93% -100% of correct answers
- 4.5 - 85% -92% of correct answers
- 4.0 - 77% -84% of correct answers
- 3.5 - 69% -76% of correct answers
- 3.0 - 60% -68% of correct answers
- 2.0 - below 60% of correct answers

**5. TOTAL STUDENT WORKLOAD NEEDED TO ACHIEVE THE INTENDED LEARNING OUTCOMES  
– NUMBER OF HOURS AND ECTS CREDITS**

Activity	Number of hours
Course hours	45
Other contact hours involving the teacher (consultation hours, examinations)	3
Non-contact hours - student's own work (preparation for classes or examinations, projects, etc.)	72
Total number of hours	120
Total number of ECTS credits	4

*\* One ECTS point corresponds to 25-30 hours of total student workload*

**6. INTERNSHIPS RELATED TO THE COURSE/MODULE**

Number of hours	NA
Internship regulations and procedures	NA

**7. INSTRUCTIONAL MATERIALS**

<p><u>Compulsory literature:</u></p> <ol style="list-style-type: none"> <li>1. Cellular and Molecular Immunology, 10th Edition 2021 Authors: Abul K. Abbas &amp; Andrew H. Lichtman &amp; Shiv Pillai</li> <li>2. All materials provided by teachers.</li> </ol>
<p><u>Complementary literature:</u></p> <ol style="list-style-type: none"> <li>1. IMMUNOLOGY. D. MALE, TAYLOR &amp; FRANCIS LTD, MAJ 2021</li> <li>2. Basic Immunology. 7th Edition, Abul K. Abbas, Andrew H. Lichtman, Shiv Pillai Elsevier 2023</li> </ol>

Approved by the Head of the Department or an authorised person