



**48SJO-IMMUN**  
**ECTS: 6.00**  
**CYCLE: 2024**

## Course syllabus - part A Immunology

### SUBJECT MATTER CONTENT

#### LECTURE

Introduction to immunology. Elements of the immune system and their functions. Innate and acquired response. Humoral and cellular response. Specific and nonspecific cellular response. Humoral immunity. Immune tolerance and autoimmune reactions. Hypersensitivity. Immunology of infection. Congenital and acquired immune deficiencies. Nutrition and immunity. Immunology of metabolic disorders. Cancer immunology. Reproductive immunology. Transplantation immunology.

#### SEMINAR

Serological diagnosis of infection, basic methods, sensitivity and specificity. Basic diagnostic methods: complement fixation test, hemagglutination test, ELISA, Western blot, IIF, PCR. Post-transfusion reactions, hematological disorders. Diagnostics of autoimmune diseases. Modern methods of allergy diagnosis

#### CLASSES

Diagnosis of *Borrelia burgdorferi* infection by ELISA and Western blot. Allergological diagnosis: prick tests, patch tests. Non-specific defense: barriers and complement system; ELISA test for C1-INH, analysis of results and their clinical significance; Specific defense: antigen-antibody reaction in immunohistochemical staining, analysis of test results for the level of various antibodies and their clinical significance; Inflammation: Acute inflammation, cassette tests, agglutination and precipitation tests, CRP test, analysis of the causes and effects of inflammation on the example of acute pancreatitis; Cross-reaction: ASO test; Chronic inflammation exemplified by hyperuricemia and gout; Analysis of differences in the course of viral and bacterial pneumonia; Blood count and cytometry; Hypersensitivity and immune deficiency: Analysis and recognition of different types of hypersensitivity, comparison of IgE and prick test results and environmental influences in allergy; Analysis of the influence of the complement system, vaccinations and tuberculin test on hypersensitivity reactions, analysis of the causes of delayed type hypersensitivity, analysis of the effects of autoantibody reactions to hormonal receptors; immune complexes in hypersensitivity; Analysis of the effects of nutritional deficiencies, the effects of viruses and genetic mutations on the defense system; Analysis of hypergammaglobulinemia in alcoholism. Immunological tolerance, autoimmunity and diseases in the hematopoietic system: tests and analyzes of anti-blood cell antibody results using gel cards: antibodies of ABO, RhD groups, Coombs test (e.g. Kell, P, Lewis, MNS); ABORh blood group analysis in relation to donor/recipient; Analysis of the effects of post-transfusion reaction; Analysis of microcytotoxic test results between a transplant donor and recipient. Determining the recipient's HLA based on the donor's HLA in kidney transplant, bone marrow transplant, second transplant; Analysis of types of autoantibodies in autoimmunity; Analysis of clinical cases of diseases related to the defense system

**Legal acts specifying learning outcomes:**  
**467/2024**

**Disciplines:** medical sciences

**Status of the**

**course:**Obligatoryjny

**Group of courses:**A -

przedmioty podstawowe

**Code:** ISCED 0912

**Field of study:**Medicine

**Scope of education:**

**Profile of education:**

General academic

**Form of studies:** full-time

**Level of studies:** uniform

master's studies

**Year/semester:** /2

**Types of classes:** Lecture, Seminar, Classes

**Number of hours in**

**semester:**Lecture: 20.00,

Seminar: 10.00, Classes:

30.00

**Language of**

**instruction:**English

**Introductory subject:**

biologia medyczna, biofizyka, biochemia

**Prerequisites:** knowledge of human anatomy, biology, especially the biological bases of cytology, physiology and genetics, organic and inorganic chemistry, biophysics, biochemistry

**Name of the organisational unit conducting the**

**course:**Katedra Fizjologii i

Patofizjologii Człowieka

**Person responsible for the**

**realization of the course:**dr

hab. n. med. Joanna Harażna,

prof. UWM

**e-mail:**

joanna.harazna@uwm.edu.pl

**Additional remarks:**

## TEACHING OBJECTIVE

mastery of knowledge by students of the structure, functions and mechanisms of the immune system, the participation of this system in the prevention, treatment and pathogenesis of diseases, as well as the application of laboratory immunological methods in diagnostics, therapy and research. Students learn the basics of laboratory work with research material such as blood and its derivatives and tissue sample

## DESCRIPTION OF THE LEARNING OUTCOMES OF THE COURSE IN RELATION TO THE DESCRIPTION OF THE CHARACTERISTICS OF THE SECOND LEVEL LEARNING OUTCOMES FOR QUALIFICATIONS AT LEVELS 6-8 OF THE POLISH QUALIFICATION FRAMEWORK IN RELATION TO THE SCIENTIFIC DISCIPLINES AND THE EFFECTS FOR FIELDS OF STUDY:

### Symbols for outcomes related to the discipline:

M/NMA\_P7S\_WG+++ , M/NMA\_P7S\_KR+ ,  
M/NMA\_P7S\_UW+++ , M/NMA\_P7S\_UW+++ , M/  
NMA\_P7S\_KO+++

### Symbols for outcomes related to the field of study:

D.U10.+ , C.W42.+ , C.W12.+ , B.W16.+ , E.U30.+ ,  
B.W15.+ , K.9.+ , C.W4.+ , C.W20.+ , C.W17.+ ,  
B.U12.+ , C.W16.+ , K.5+ , KA7\_UW5+ , B.W21.+ ,  
C.W19.+ , KA7\_UU1+ , K.6.+ , K.7.+ , C.W18.+ ,  
D.U4.+ , B.U8.+ , KA7\_UK2+ , KA7\_KR1+ , K.8.+ ,  
K.11.+ , C.W39.+

## LEARNING OUTCOMES:

### Knowledge:

W1 - The student acquires the knowledge of lectures, classes and seminars, learns the structure, functions and mechanisms of the immune system. Learns about the mechanisms of the defense system in the prevention, treatment and pathogenesis of diseases and the application of laboratory immunological methods in diagnostics, therapy and research. The student describes the main histocompatibility system, determines the genetic basis for selecting a donor and transplant recipient B.W15. metabolic changes occurring in organs and the metabolic, biochemical and molecular basis of diseases and therapies B.W16. methods of communication between cells and between the cell and the extracellular matrix and signal transduction pathways in the cell, as well as examples of disorders in these processes leading to the development of cancer and other diseases B.W21. processes occurring during the aging of the body and changes in the functioning of organs related to aging C.W12. pathogenesis and pathophysiology of infections and contagions and the impact of pathogenic factors such as viruses, bacteria, fungi, prions and parasites on the human body and population, including the ways of their impact, the consequences of exposure to them and the principles of prevention C.W16. principles of diagnosis of infectious, allergic, autoimmune and cancer diseases as well as blood diseases, based on the antigen-antibody reaction C.W17. principles of disinfection, sterilization and aseptic procedure C.W18. specific and non-specific mechanisms of humoral and cellular immunity C.W19. major histocompatibility system C.W20. types of hypersensitivity reactions, types of immunodeficiencies and basics of immunomodulation C.W4. genetic determinants of human blood groups and serological conflict in the Rh system C.W39. consequences of deficiency and excess of vitamins and minerals C.W42. molecular basis of cancer diseases and issues in the field of cancer immunology

### Skills:

U1 - The student learns various immunological diagnostic techniques, is able to perform them and interpret the result, also in the thematic analysis of a clinical case and applies the principles of sepsis and antiseptics in working with blood and its derivatives B.U12. use basic laboratory and molecular techniques B.U8. use medical databases and

properly interpret the information contained therein needed to solve problems in the field of basic and clinical sciences D.U10. use open and closed questions, paraphrase, clarification, internal and final summaries, signaling, active listening (e.g. capturing and recognizing signals sent by the interlocutor, verbal and non-verbal techniques) and facilitation (encouraging the interlocutor to speak) appropriate to the situation. D.U4. demonstrate responsibility for improving one's qualifications and transferring knowledge to others D.U5. critically analyze medical literature, including in English, and draw conclusions E.U30. apply the principles of providing feedback (constructive, non-judgmental, descriptive) as part of team cooperation KA7\_UK2 communicate in a team and share knowledge KA7\_UW5 plan your own educational activity and constantly educate yourself to update your knowledge KA7\_UU1 inspire the learning process of others

### **Social competence:**

K1 - The student knows the rules of professionalism, especially in laboratory work with infectious material, uses objective sources of information, understands the rules of teamwork K.5 perceiving and recognizing one's own limitations and self-assessing educational deficits and needs K.6. promoting healthy behaviors K.7. using objective sources of information K.8. formulating conclusions from your own measurements or observations K.11. accepting responsibility for decisions made in the course of professional activity, including in terms of the safety of oneself and other people K.9. implementing the principles of professional camaraderie and team cooperation, including with representatives of other medical professions, also in a multicultural and multinational environment KA7\_KR1 observe and apply the principles of academic and professional ethics and professional image, academic, social and professional professionalism

### **TEACHING FORMS AND METHODS:**

Lecture(W1;):Lecture with presentations

Seminar(W1;U1;K1;):presentations, discussion of prepared issues, discussion

Classes(W1;U1;K1;):laboratory classes include: individual performing of experiments and diagnostic tests as well as analysis and interpretation of results; filling in thematic reports prepared by the teacher, discussing clinical cases illustrating the issue

### **FORM AND CONDITIONS OF VERIFYING LEARNING**

#### **OUTCOMES:**

Lecture (Written exam) - The topics of the lectures may fall within the scope of the partial test necessary to complete the semester course, the material carried out during lectures, seminars and exercises is included in the thematic scope of the immunology exam. The conditions for admission to the exam is passing the classes and seminars and obtaining at least a satisfactory written exam evaluation. -

Seminar (Evaluation of the work and cooperation in the group) - Evaluation of the work and cooperation in the group - The topics discussed at the seminars fall within the scope of 2 tests. Passing both tests and a positive assessment of the work and cooperation in the group - students will be assessed individually - determine the evaluation of the seminars. The final evaluation for the seminars will be calculated as the mean grade for individual work at seminars, averaged with the grade from 2 tests. -

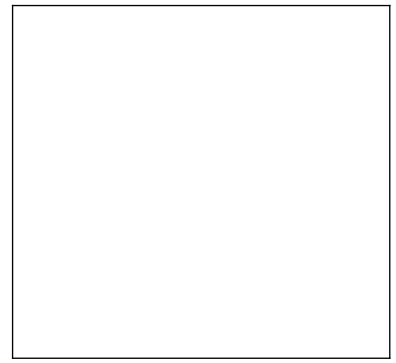
Classes (Colloquium test) - Topics discussed during classes and seminars fall within the scope of 2 tests. Passing two tests and a positive assessment of the work and cooperation in the group during the classes - students will be assessed individually - determine the passing of the classes. The final grade for the exercises will be calculated as the average grade for individual work during the exercises, averaged with the grade from 2 tests -

**BASIC LITERATURE:**

1. Abul K. Abbas, Andrew H. Lichtman, Shiv Pillai,, *Basic Immunology: Functions and Disorders of the Immune System.*, Wyd. Elsevier, R. 2019
2. Abul K. Abbas, Andrew H. Lichtman, Shiv Pillai,, *Cellular and Molecular Immunology*, Wyd. Elsevier, R. 2021

**SUPPLEMENTARY LITERATURE:**

1. Vinay Kumar, Abul K. Abbas, Jon Aster,Robbins, *Basic Pathology*, Wyd. Elsevier, R. 2017



# Detailed description of ECTS credits awarded - part B

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**ECTS: 6.00**

**CYCLE: 2024**

## Immunology

The number of ECTS credits awarded consists of:

1. Contact hours with the academic teacher:

- participation in: Lecture	20.0 h
- participation in: Seminar	10.0 h
- participation in: Classes	30.0 h
- consultation	4.0
	Total: 64.0 h.

2. Independent work of a student:

Preparation for classes, tests, examinations, preparation of reports for the completion of exercises, consultations	86.00 h
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Total: 86.0 h

contact hours + independent work of a student Total: 150.0 h

1 ECTS credit = 25-30 h of an average student's work, number of ECTS credit = 150.0 h : 25.0 h/ECTS = 6.00 ECTS on average: 6.0 ECTS

- including the number of ECTS credits for contact hours with the direct participation of an academic teacher: 0,00 ECTS points,

- including the number of ECTS credits for hours of independent work of a student: