

## Course Syllabus

### I. General Information

Course name in English	Applied immunotechnologies
Course name in Polish	Immunotechnologia stosowana
Programme	Bioanalytical technologies
Level of studies (BA, BSc, MA, MSc, long-cycle MA)	MSc
Form of studies (full-time, part-time)	Full-time
Discipline	Biological sciences
Language of instruction	English

Course coordinator/person responsible	Dr Daria Ler
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Type of class ( <i>use only the types mentioned below</i> )	Number of teaching hours	Semester	ECTS Points
lecture	30	III	6
tutorial			
classes	30	III	

Course pre-requisites	Principles of Molecular Biology, Biochemistry and Molecular Biology Techniques
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### II. Course Objectives

C1- Identify the fundamentals of immunologic science for the management of human disease and its clinical relevance.
C2- Identify key immunologic and molecular processes with comprehensive and consistent design program.
C3- Become proficient with the experimental observations and techniques required to perform the most commonly used protocols at the molecular, cellular, and whole-organism levels.
C4- Identify the components of well-controlled analysis.
C5- Use critical thinking skills to troubleshoot problems as they occur and determine possible causes.

### III. Course learning outcomes with reference to programme learning outcomes

Symbol	Description of course learning outcome	Reference to programme learning outcome
<b>KNOWLEDGE</b>		
W_01	Investigate fundamental principles of molecular immunological methods and their implications in human diseases and treatment.	K_W05
W_02	The students will explore the principles of methodology, quality assurance and the application of immuno-technologies to the research and clinical laboratory.	K_W08
W_03	The students are exposed to aspects of statistics, quality control, regulatory issues and applications of immunological	K_W04

	methods to the diagnosis and prognosis of the disease.	
<b>SKILLS</b>		
U_01	The student follows and apply related protocols and tools in basic and clinical research. Successfully develop protocols and implement them.	K_U11,K_U08
U_02	The student comprehend current laboratory approaches through applying immuno-biochemical and molecular biology principles.	K_U01
U_03	Correlating tools used in research with biochemical and immunological applications on cellular level.	K_U08
U_04	To recognize the importance of strong work ethics, persistence and intellectual integrity.	K_U10
U_05	Working as a team member, be responsible, confident, independent and able to actively participate in discussions and tasks.	K_U18
<b>SOCIAL COMPETENCIES</b>		
K_01	Understands gradually the important role of good laboratory and clinical practice.	K_K03

#### IV. Course Content

<p>1: Properties and overview of immune responses; types of immunity, cellular components.</p> <p>2: Innate immunity, stimulation and mechanisms of limitations.</p> <p>3: Antibodies and antigens: structure, synthesis, assembly and expression.</p> <p>4: The major histocompatibility complex, properties and processing of protein antigens.</p> <p>5: Immune receptors and signal transduction: immune receptor family, T-cell receptor, B-lymphocyte antigen receptor complex.</p> <p>6: Lymphocyte development and antigen receptor gene rearrangement.</p> <p>7: Differentiation and functions of CD4+ and CD8+ effector T cells.</p> <p>8: B cell activation and Antibody production.</p> <p>9: Mechanism of humoral immunity: neutralization, opsonisation and phagocytosis.</p> <p>10: Immunologic tolerance and mechanism of autoimmunity.</p> <p>11: Immunity to microbes: bacteria, fungi, viruses; vaccine development.</p> <p>12: Transplantation immunology.</p> <p>13: Tumour immunity: tumour antigens, immune response, immunotherapy.</p> <p>14: Hypersensitivity: mechanisms and classification, therapeutic approaches.</p> <p>15: Allergy: IgE production and allergic reactions, genetic susceptibility, pathogenesis and therapy.</p>
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#### V. Didactic methods used and forms of assessment of learning outcomes

Symbol	Didactic methods <i>(choose from the list)</i>	Forms of assessment <i>(choose from the list)</i>	Documentation type <i>(choose from the list)</i>
<b>KNOWLEDGE</b>			
W_01	Conventional lecture/Discussion	Written test	Evaluated written test/test

W_02	Conventional lecture/Discussion	Written test	Evaluated written test/test
W_03	Conventional lecture/Discussion	Written test	Evaluated written test/test
<b>SKILLS</b>			
U_01	Laboratory classes	Observation and Report	Observation report, Report printout
U_02	Laboratory classes	Test of practical skills	Rating card
U_03	Practical classes	Observation and Report	Observation report, Report printout
U_04	Laboratory classes	Report	Report printout
U_05	Laboratory classes	Observation	Observation report
<b>COMPETENCIES</b>			
K_01	Laboratory classes	Observation	Observation report

#### VI. Grading criteria, weighting factors,

Written test to pass the lecture: 100%

Laboratory classes:

80% grades from written tests

10% reports

10% practical skills

Mark	Evaluation criteria	
<b>Very good (5)</b>	the student realizes the assumed learning outcomes at a very good level	the student demonstrates knowledge of the education content at the level of 95-100%
<b>overgood (4.5)</b>	the student accomplishes the assumed learning outcomes an over good level	the student demonstrates knowledge of the education content at the level of 85-94 %
<b>Good (4)</b>	the student accomplishes the assumed learning outcomes at a good level	the student demonstrates knowledge of the education content at the level of 75-84%
<b>Quite good (3.5)</b>	the student accomplishes the assumed learning outcomes at a quite good level	the student demonstrates knowledge of the education content at the level of 65-74%
<b>sufficient (3)</b>	the student accomplishes the assumed learning outcomes at a sufficient level	the student demonstrates knowledge of the education content at the level of 55-64%
<b>insufficient (2)</b>	the student accomplishes the assumed learning outcomes at an insufficient level	the student demonstrates knowledge of the education content below the level of 55%

## VII. student workload

Form of activity	Number of hours
Number of contact hours (with the teacher)	70 (60 + 10 individual consultation)
Number of hours of individual student work	80

## VIII. Literature

Basic literature
1. Abbas, Abul K.; Lichtman, Andrew H.; Pillai, Shiv.: Cellular and molecular immunology 9th ed, Elsevier Science Health Science (2017)
2. Jenni Punt, Sharon Stranford, Patricia Jones, Judy Owen: Kuby Immunology, W. H. Freeman; Eighth edition (2018)
Additional literature
1. The World of the Cell by Hardin, Bertoni, Kleinsmith (PEARSON) (2012)