

NAME OF THE COURSE		Basic Immunology				
Code	PMB724	Year of study	2.			
Course teacher	Assoc. prof. Ivana Novak Nakir, PhD	Credits (ECTS)	5			
Associate teachers	Mija Marinković, PhD	Type of instruction (number of hours)	L	S	P	F
			17	30	15	
Status of the course	Obligatory	Percentage of application of e-learning	0% (If needed, could be 80%)			
COURSE DESCRIPTION						
Course objectives	Understanding the basic principles of the immune response. Basic knowledge of immune system disorders. Understanding immunomodulation.					
Course enrolment requirements and entry competences required for the course	«Molecular biology of the cell» course finished and passed.					
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul style="list-style-type: none"> <li>• Explain how innate and acquired immune system works. Integration of their interaction in the immune response to defend the organism. Proper use of immune terminology.</li> <li>• Name immune cells and antibody classes. Describe their mechanism of action. Explain the diversity of antibodies and T- and B-cell receptors.</li> <li>• Describe the most important cytokines and MHC molecules and define their main functions.</li> <li>• Distinguish the main immune disorders (hypersensitivity, autoimmunity and immunodeficiency), name their subtypes and explain the mechanism of their development.</li> <li>• Calculation of the total number of leukocytes in the blood. Differential blood count understanding. Referent values.</li> <li>• Distinguish between types of vaccines and their application.</li> <li>• Knowledge of the basic immunomodulation. Knowledge of modern immune components-based methods in disease treatment.</li> <li>• Give examples of research techniques used to analyze antigens and immune cells.</li> </ul>					
Course content broken down in detail by weekly class schedule (syllabus)	<p><b>Lectures:</b></p> <p>P1 (3 hours) - Basics of immunology  P2 (2 hours) - Innate immunity  P3 (2 hours) - Cytokines  P4 (2 hours) - Microbiome  P5 (2 hours) - Research methods in immunology  P6 (2 hours) - Autophagy and immunity  P7 (2 hours) - Immunomodulation  P8 (2 hours) - Vaccines</p> <p><b>Seminars:</b></p> <p>S1 (3 hours) - Antigen presentation. MHC.  S2 (3 hours) - Antigen recognition. Antibodies. Acquired immunity.  S3 (3 hours) - Cellular immunity.  S4 (3 hours) - Effective mechanisms of cellular immunity.  S5 (3 hours) - Humoral immunity.  S6 (3 hours) - Effective mechanisms of humoral immunity. Complement.  S7 (3 hours) - Immune tolerance. Autoimmunity. Tumor immunity.  S8 (3 hours) - Transplantation. Hypersensitivity.  S9 (3 hours) - Congenital and acquired immunodeficiencies. Clinical cases.</p>					

	S10 (3 hours) - Latest knowledge on vaccines. <b>Practicals:</b> P1 (3 hours) - Leukocytes P2 (3 hours) - Differential blood count P3 (3 hours) - Antigen determination by ELISA. P4 (3 hours) - Determination of antigen by immunohistochemical methods. P5 (3 hours) - Flow cytometry in research and diagnostics. Blood cell analysis by flow cytometer.					
Format of instruction	x lectures X seminars and workshops X exercises <input type="checkbox"/> <i>on line</i> in entirety X partial e-learning (if needed) <input type="checkbox"/> field work			<input type="checkbox"/> independent assignments <input type="checkbox"/> multimedia x laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)		
Student responsibilities	Regular class attendance. Preparation of the seminars.					
Screening student work ( <i>name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course</i> )	Class attendance	1	Research		Practical training	
	Experimental work	1	Report		(Other)	
	Essay		Seminar essay	1	(Other)	
	Tests		Oral exam	1	(Other)	
	Written exam	1	Project		(Other)	
Grading and evaluating student work in class and at the final exam	Written and/or oral exam.					
Required literature (available in the library and via other media)	<b>Title</b>				<b>Number of copies in the library</b>	<b>Availability via other media</b>
	Basic Immunology, ed. 6th. Abbas A., Lichtman A. H., Pillai S. Elsevier, 2019.					
Optional literature (at the time of submission of study programme proposal)	1. Cellular and molecular immunology, ed. 9th, Abbas A., Lichtman A. H., Pillai S. Elsevier, 2017. 2. Case studies in immunology: A clinical companion. Geha R, Notarangelo L. 6th ed. New York: Garland Science; 2011 or newest edition 2021.					
Quality assurance methods that ensure the acquisition of exit competences	Analysis of the quality of teaching by students and teachers. Exam pass analysis. External evaluation.					
Other (as the proposer wishes to add)						