

<i>Name of the course</i>	Immunology			Code	
<i>Type of study program Cycle</i>	Integrated University Study, Medicine			Year of study	II
<i>Credits (ECTS) :</i>	4,5	<i>Semester</i>	IV	Number of hours per semester (l+e+s)	27+19+4
<i>Status of the course:</i>	mandatory	<i>Preconditions:</i>	Passed all exams of the 1 st year	<i>Comparative conditions:</i>	
<i>Access to course:</i>	2 nd year students			<i>Hours of instructions:</i>	According to schedule
<i>Course teacher:</i>	Ivan Čavar, MD, PhD, assistant professor				
<i>Consultations:</i>	As agrees				
<i>E-mail address and phone number:</i>	ivancavarswe@yahoo.com /+38736335634				
<i>Associate teachers</i>	Katarina Majstorović, MD				
<i>Consultations:</i>	according to deal				
<i>E-mail address and phone number:</i>	katarina.majstorovic@yahoo.com				
<i>The aims of the course:</i>	The aims of this course are: understanding the structure and function of the immune system of a healthy organism, the basic mechanisms of immune reactions, fundamental disorders and interventions in the immune system.				
<i>Learning outcomes (general and specific competences):</i>	<p><u>General competences:</u> Applying the independent learning through critical and self-critical questioning of scientific truth during the study.</p> <p>Remembering the possession of personal qualities of personality through personal contribution during classes (interest and active participation and building positive relationship with members of the group).</p> <p><u>Specific competences:</u> Understanding, applying and analyzing the structure and function of the immune system in health (physiological aspects) and disorders of the immune system which meets the importance of theoretical knowledge of immunology.</p> <p>Understanding the complex mechanisms of the disease with immunopathogenic background. Understanding the basic principles of immunodiagnosics, and basic interventions in the functioning of the immune system (immunization, immunomodulation,</p>				

	<p>immunosuppression, transplantation), which will synthesize critical thinking about the importance of these procedures in the practical medicine.</p> <p>Outcomes will be evaluated with continuous assessment, active forms of learning during lectures and seminars, and final written and oral exam.</p>			
Course content (Syllabus):	<p>Education in the course of immunology consists of 10 teaching units, assessment during the seminars and 2 written weekly test assessment. Each thematic unit includes: 2-6 hours of lectures and 2-3 hours of seminars and 2 hours of exercises which include 2 thematic units.</p>			
Format of instruction (mark in bold)	Lectures	Exercises	Seminars	Independent assignments
	Consultations	Work with mentor	Field work	Other
	<p>Remarks: The teaching of each unit begins with lectures and /or seminars. During the seminars, students actively participate and critically discuss about thematic unit which they should prepare in advance.</p> <p>At the end of each week, students have seminar for repetition with a written test, where students can collect extra points for a final written test. During exercises, students learn basic principles of flow cytometry, indirect immunofluorescence and ELISA.</p>			
Student responsibilities	<p>Students are required to attend classes, it is allowed to be absent 20 % of classes. Students are required to prepare for each seminar and week assessment of knowledge, so that they can actively participate in classes. A precondition for taking oral exam is previously passed the written exam.</p>			
Screening student work (mark in bold)	Class attendance	Class participations	Seminar essay	Practical training
	Oral exam	Written exam	Continuous assesment	Essay
Detailed evaluation within a European system of points				
STUDENTS RESPONSIBILITIES	HOURS	PROPORTIONS OF ECTS CREDITS	PROPORTION S OF MARK	
Class attendance and participations	15	0,5	0 %	
Written exam	90	3	70%	
Oral exam	25	1	30%	

Further clarification:

Student activity during seminars and the weekly preliminary exam/coloquium will be rewarded, so that students can achieve a maximum of 4 additional points on written part of the test which can maximize the grade of the final written test for 1 degree.

The written part of the test consists of 50 questions with multiple choice and the final grade is obtained according to the Regulation of Studies (see. down below). Written exam with extra points makes 70% of the final grade, while the oral exam makes 30% of the final grade, which means that students on the oral exam may increase or possibly decrease the grade that they have made in the written test for a maximum of 1 degree.

In the case that students pass a written test, but do not pass the oral exam, the written part of the test will be valid during the current academic year.

According to the regulations of the study, final grade is obtained:

- A = 91-100% 5
- B = 79 to 90% 4
- C = 67 to 78% 3
- D = 55 to 66% 2
- F = 0 to 54% 1

Required literature:	Andreis I, Batinić D, Čulo F, Grčević D, Lukinović Škudar V, Marušić M, Taradi M, Višnjić D. Immunology, 7 th edition. Zagreb: Medical edition. 2010.
Optional literature:	Abbas, AK, Lichtman, AH, Pillai S. Cellular and molecular immunology, 8 th Edition. Elsevier Canada, 2015. „Hand-outs“ and websites of immunology (especially for exercises): http://www.hhmi.org/biointeractive/immunology/vlab.html http://www.hhmi.org/biointeractive/vlabs/immunology/index.html http://www.science4u.info/virtuallab/index.htm http://vibe.stanford.edu/
Additional information about the course	Monitoring methods of teaching quality: <ul style="list-style-type: none">- student questionnaire- analysis the teaching quality of teachers- exam results analysis- report of the office for teaching quality- external evaluation (visit of team for control quality)

Annexes: calendar classes

<i>The number of teaching units</i>	TOPICS AND LITERATURE
<i>I.</i>	Title: Introduction to the immune system
	Short description: structure and function of the immune system, cells and organs
	Literature: required and optional
<i>II.</i>	Title: Nonspecific immunity
	Short description: components and basic mechanisms of nonspecific immunity
	Literature: required and optional
<i>III.</i>	Title: Antigens and antibodies
	Short description: antigens, MHC antigens, erythrocyte antigen, antibodies and their structure
	Literature: required and optional
<i>IV.</i>	Title: Cytokines and chemokines, system of complement
	Short description: cytokines of innate and adaptive immunity, chemokines, activation and function of complement
	Literature: required and optional
<i>V.</i>	Title: Humoral immunity
	Short description: executive mechanisms of humoral immunity, B – lymphocytes
	Literature: required and optional
<i>VI.</i>	Title: Cell immunity
	Short description: executive mechanisms of cell immunity, helper and cytotoxic T cells
	Literature: required and optional
<i>VII.</i>	Title: Regulation of the immune response
	Short description: phase of immune response, negative feedback regulation, cell regulation, idiopathic regulation, neurohumoral and gene regulation
	Literature: required and optional
<i>VIII.</i>	Title: Immune tolerance, immunosuppression, autoimmunity
	Short description: central and peripheral tolerance, basic mechanisms of immunosuppression, basic principles of autoimmunity
	Literature: required and optional
<i>IX.</i>	Title: Immunological response to tumors and transplants
	Short description: tumor antigens, avoiding mechanisms of immune control in tumors, transplantation antigens, immunological mechanisms of rejection in transplanted tissue and organs
	Literature: required and optional
<i>X.</i>	Title: Hypersensitivity. Primary and secondary immunodeficiencies
	Short description: types of hypersensitivity, antibodies – mediated hypersensitivity, cytotoxic hypersensitivity, immune complexes - mediated

	hypersensitivity, cell-mediated hypersensitivity, primary and secondary immunodeficiencies
	Literature: required and optional
XI.	Title: Immunological laboratory methods
	Short description : reactions to demonstrate humoral and cell immunity
	Literature: required and optional