LABORATORY TECHNOLOGIES IN IMUNOLOGY	
GENERAL INFORMATION	
Course teacher	Prof. Jasminka Milas Ahić, MD, PhD
Associates	Prof. Jerko Babić, MD, PhD Asst. Prof. Vlatka Periša, MD, PhD Asst. Prof. Teuta Opačak-Bernardi, Mbiol., PhD Asst. Prof. Tihana Šimundić, MD, PhD
Study programme	Graduate University Study of Medical Laboratory Diagnostics
Course status	Elective
Year of study, semester	1st year, 2nd semester
ECTS credits	**5**
Form of teaching (number of classes)	Lectures: 35; seminars: 20; practicums: 15
Expected number of students attending the course	20
COURSE DESCRIPTION	
Course objectives	
Objective of the course is to expand previous knowledge and acquire specific skills required to work in laboratories which use specific laboratory procedures in immunology.	
Course entry requirements and competencies needed for the course	
Completed courses at the Undergraduate Study Programme of Medical Laboratory Diagnostics or equivalent bachelor's degree (baccalaureate)	
Learning outcomes at study programme level	
1.1, 1.2, 2.1, 2.2, 2.3, 2.6, 3.1, 3.2	
Expected learning outcomes at course level	
After attending lectures, seminars, practicums, independent study and passing the exam, students will be able to: 1. explain the pathophysiological processes in autoimmune diseases. 2. Apply basic knowledge of immunology and immunopathology in laboratory diagnostics and implementation of new laboratory procedures for detection and monitoring of diseases and the effect of therapy. 3. Critically evaluate methods for immunological testing of various autoimmune and allergic diseases. 4. Choose appropriate laboratory technologies and methods for material processing and analysis. 5. use complex automatic analyzers in immunological laboratories. 6. valorize the results of immunogenetic testing.	
Course content	
Lectures: Pathophysiology of autoimmune diseases. Organ specific and systemic autoimmune diseases. Rheumatoid arthritis, asthma and autoimmune thyroid diseases. Pathophysiology of SLE, vasculitis, dermatomyositis/polymyositis, diagnosis and treatment. Immune hypersensitivity. Immunological therapy: biological therapy, immunization, desensitization, immunosuppression, immunization. Pathophysiology of transplant reactions. Kidney transplantation. HLA system in transplantation. Congenital and acquired immunodeficiencies. Immunoproliferative diseases. Leukemias, lymphomas - interpretation of laboratory findings and treatment. Autoimmune hemolytic anemia. Autoimmune thrombocytopenia. Pathophysiology of gluten enteropathy, diagnosis, treatment. Immunophenotyping in clinical application. Laboratory methods in immunological and hematological diseases. Immunopathogenesis of the systemic response during SARS-COV-2 infection. Pathogenesis of asthma. Raynaud's syndrome - significance in	

immunological diseases. Hereditary and acquired angioedema - treatment, treatment and prevention. Anthophospholipid syndrome.

Seminars: Immunological tests in autoimmune diseases and in rheumatoid arthritis. Immunological tests in SLE, vasculitis, DM/PM. In vitro tests in allergies. Immunology - patient reports. Goodpasture syndrome. Rejection of a transplanted kidney - laboratory findings. HLA typing, meaning in immunological diseases. Western blot. Laboratory treatment of autoimmune anemias, fetal erythroblastosis. In vitro tests in allergies.

Exercises: PRICK testing for inhalation and nutritional allergens. interpretation and significance of HLA typing in immunological diseases. Interpretation of hematological laboratory findings. Interpretation of allergy tests and tests for celiac disease. Capillaroscopy - application in clinical practice and interpretation of findings. Interpretation of immunological findings in patients with SLE, RA, systemic sclerosis.

Forms of teaching

Lectures; seminars, practicums, independent assignments.

Students' responsibilities

Attendance is obligatory throughout all course forms, and the student has to attend all the exams. Student absence of up to 30% is considered acceptable in each teaching form. Practical work and seminars that were not completed have to be taken in the form of colloquiums. The student has to attend all forms of exams required.

Monitoring students' work *(Connecting learning outcomes, teaching methods and evaluation)*

Teaching activity	ECTS	Learning outcome	Student activity	Evaluation methods	Grade points	
					Min.	Max.
Attending classes (lectures,	1.5	1-6	Attendance,	Attendance records	5	10
Seminars			Seminar paper	Writing and presenting seminar paper	15	20
Practicums		4-6	Practical work	Submitted report	15	20
Final exam	3.5	1-6	Studying for final exam	Written exam	15	50
Total	**5**				**50**	**100**

Evaluation of written part of final exam

Percentage of correct answers (%)	Grade points
60.00-64.99	15
65.00-69.99	20
70.00-74.99	25
75.00-79.99	30
80.00-84.99	35
85.00-89.99	40
90.00-94.99	45
95.00-100	50

Formulating the final grade:
Grade points achieved in classes are combined with points achieved in the final exam. Grading in the ECTS system is absolute grading and represents one's final achievement. Grades are numerically expressed as follows: A – excellent (5): 80-100 grade points; B – very good (4): 70-79.99 grade points; C – good (3): 60-69.99 grade points; D – sufficient (2): 50-59.99 grade points

Assigned reading (available in the library and in other media)

Title	Number of copies in the library	Availability in other media
I.Andreis, D.Batinić, F.Culo, D.Grčević, M.Marušić, M.Taradi, D.Višnjić. Imunologija, Med.naklada, Zagreb, 2010	10	
Recent scientific articles recommended by the teacher		On line

Further reading

Abbas A i sur. Osnove imunologije. Funkcije i poremećaji imunološkog sustava. 5th Edition, Medicinski fakultet Sveučilišta u Splitu, 2017.

Quality assurance methods that ensure the acquisition of exit competencies

Anonymous, quantitative, standardised students' opinion survey on the course and teacher's work, carried out by the Quality Assurance Office of the Faculty of Medicine in Osijek.