

<b>LABORATORY TECHNOLOGIES IN CLINICAL BIOCHEMISTRY</b>	
<b>GENERAL INFORMATION</b>	
Course teacher	Asst. Prof. Vatroslav Šerić, MMedBiochem, PhD
Associates	Asst. Prof. Sanja Mandić, MMedBiochem, PhD Marija Milić, MmedBiochem, PhD Tihana Pavošević, MMedBiochem Maja Lukić, MMedBiochem Tara Rolić, MMedBiochem
Study programme	University Graduate Study of Medical Laboratory Diagnostics
Course status	Elective
Year of study, semester	1 <sup>st</sup> year, 2 <sup>nd</sup> semester
ECTS credits	<b>5</b>
Form of teaching (number of classes L+S+P+e-learning)	Lectures: 35; seminars: 20; practicums: 15
Expected number of students attending the course	20
<b>COURSE DESCRIPTION</b>	
<b>Course objectives</b>	
Introduce students to general principles of laboratory technologies used in diagnostics. Introduce students to application of such technologies in determination of individual analytes. Present to the students. To show students the most important procedures for the implementation of analyzes and the shortcomings of individual measurement procedures.	
<b>Course entry requirements and competencies needed for the course</b>	
Completed courses at the Undergraduate Study Programme of Medical Laboratory Diagnostics or equivalent bachelor's degree (baccalaureate)	
<b>Learning outcomes at study programme level</b>	
<b>1.1, 1.2, 2.1, 2.2, 2.3, 2.6, 3.1, 3.2</b>	
<b>Expected learning outcomes at course level</b>	
After attending all lectures and completing all seminars and practical work, studying independently and passing the exam, the students will be able to: <ol style="list-style-type: none"> <li>1. apply clinical knowledge in laboratory diagnostics and the implementation of new laboratory procedures for the detection and monitoring of diseases and the effect of therapy.</li> <li>2. critically evaluate measurement technologies for testing samples in different conditions.</li> <li>3. choose appropriate laboratory technologies and methods for material processing and analysis.</li> <li>4. use complex automatic analyzers in medical-biochemical laboratories.</li> <li>5. valorize the results of immunogenetic testing.</li> </ol>	
<b>Course content</b>	
<b>Lectures:</b> Presentation of the development of measuring technologies in diagnostics. Principles of certain measurement technologies: UV VIS, FTIR spectroscopy; osmometry; nephelometry and turbidimetry; flame photometry; atomic absorption spectroscopy; electrochemical methods, ion-selective electrodes (ISE); thin-layer, gas, high-pressure and liquid chromatography; capillary and gel electrophoresis; Immunochemical methods. Application in laboratory diagnostics.	

**Seminars:** Laboratory methods in diagnostics: UV VIS, FTIR spectroscopy; osmometry; nephelometry and turbidimetry; flame photometry; atomic absorption spectroscopy; electrochemical methods, ion-selective electrodes; thin-layer, gas, high-pressure and liquid chromatography; capillary and gel electrophoresis; Immunochemical methods.

**Exercises:** Independent work on laboratory devices and on the application of laboratory methods on biological samples. Utilization of LCMS.

#### Forms of teaching

Lectures; seminars; practicums.

#### 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.

#### Grading and evaluating of students' work during classes and in the final exam

Teaching activity	ECTS	Learning outcome	Student activity	Evaluation methods	Grade points	
					Min.	Max.
Attending classes Lectures	0.25	1-5	Attendance	Attendance records	1	5
Seminars	0.5		Preparation of seminar work	Seminar paper	5	15
Practicums	0.75		Practical work	Submitted report	4	10
Final exam	3.5	1-5	Studying for final exam	Written exam	20	35
				Oral exam	20	35
<b>Total</b>	<b>5</b>				<b>50</b>	<b>100</b>

#### Evaluation of written part of final exam

Percentage of correct answers (%)	Grade points
60.00-64.99	20
65.00-69.99	23
70.00-74.99	25
75.00-79.99	27
80.00-84.99	29
85.00-89.99	31
90.00-94.99	33
95.00-100	35

#### 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
E. Topić, D. Primorac, S. Janković, M. Štefanović i sur. <i>Medicinska biokemija i laboratorijska medicina u kliničkoj praksi. Medicinska naklada, Zagreb, 2018.</i>	8	
Selected scientific and professional papers and web sites for e-learning		On line

**Further reading**

Čepelak I, Štraus B, Dodig S, Labar B. Medicinsko biokemijske smjernice, Medicinska naklada, Zagreb, 2004, selected chapters

**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.