

<b>CLINICAL AND TOXICOLOGICAL ANALYSES</b>	
<b>GENERAL INFORMATION</b>	
Course teacher	Asst. Prof. Sanja Mandić, MMedBiochem, PhD
Associates	Asst. Prof. Dario Mandić, MMedBiochem, PhD Asst. Prof. Vesna Horvat, MMedBiochem, PhD Iva Lukić, MMedBiochem
Study programme	University Graduate Study of Medical Laboratory Diagnostics
Course status	elective
Year of study, semester	2 <sup>nd</sup> year, 4 <sup>th</sup> semester
ECTS credits	<b>3</b>
Form of teaching (number of classes)	Lectures 25; Seminars: 15; Practicums: 5
Expected number of students attending the course	20
<b>COURSE DESCRIPTION</b>	
<b>Course objectives</b>	
Objective of this course is the application, analysis and evaluation of knowledge and skills related to the role and significance of clinical and toxicological laboratory, as well as to toxicology and analysis of pharmaceuticals and other substances significant for clinical and court practice.	
<b>Course entry requirements and competencies needed for the course</b>	
Completed 1 <sup>st</sup> year courses at UGS of Medical Laboratory Diagnostics	
<b>Learning outcomes at study programme level</b>	
<b>1.1, 1.2, 2.1, 2.2, 2.5, 2.6, 2.7, 3.1, 3.2</b>	
<b>Expected learning outcomes at course level</b>	
After attending lectures, completing seminars and exercises, independent study and passing the exam, students will be able to: <ol style="list-style-type: none"> <li>1. critically evaluate the methodology of clinical toxicology.</li> <li>2. prepare and analyze the sample.</li> <li>3. apply knowledge and skills about laboratory diagnostic methods in practice.</li> <li>4. organize the work of the toxicological laboratory in accordance with good laboratory practice.</li> <li>5. analyse biological samples in terms of quality and quantity by using appropriate pre-analytical, analytical and post-analytical methods.</li> </ol>	
<b>Course content</b>	
<p><b>Lectures:</b> Clinical toxicology as a field of toxicology. Poison control centres. Clinical and toxicological laboratory, role in poisoning diagnosis and treatment. Laboratory organisation and good laboratory practice. Role of laboratory in poisoning diagnosing and treatment. Analysis of alcohol in clinical and forensic toxicology. Toxicology and qualitative and quantitative analysis of pharmaceuticals (benzodiazepines, phenothiazines, tricyclic antidepressants, nonsteroidal analgesics, <math>\beta</math>-blockers) and other substances that most commonly cause poisoning. Screening methods. Identification and quantification of addictive substances. Drug abuse in sport. Testing in the workplace.</p> <p>Practical classes form an integral continuation of theoretical classes. Practical classes are organized and conceived to enable students to understand the entire process of clinical and toxicological analyses. Case studies and interpretation of results. Case studies and interpretation of results. Determining blood alcohol content, also post-mortem. Alcohol analysis in the thigh muscle. Abuse of drugs in sports. Workplace testing.</p> <p><b>Seminars:</b> Methods in toxicology. Laboratory organization: clinical vs forensic. Means of addiction. Medicines. Treatment of an acutely intoxicated patient.</p>	

**Exercises:** Determination of alcohol in blood and postmortem. Analysis of alcohol in the thigh muscle.

**Forms of teaching**

Lectures; seminars and practicums, independent assignments.

**Students' responsibilities**

Attendance is obligatory throughout all course forms, and the student has to attend all the exams. The student may be justifiably absent for up to 30% of 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	0.25	1-5	Attendance,	Attendance records	2	5
Seminars	0.5		Seminar paper	Writing and presenting seminar paper	3	15
Lab. exercises	0.25	3,5	Practical work	Exercises in a clinical laboratory	5	10
Final exam	2	1-5	Studying for final exam	Written exam	40	70
<b>Total</b>	<b>3</b>				<b>50</b>	<b>100</b>

*Evaluation of written part of final exam*

Percentage of correct answers (%)	Grade points
96.00-100	70
90.00-95.99	60
80.00-89.99	50
70.00-79.99	45
60.00-69.99	40

*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
Topić E, Primorac D, Janković S, Štefanović D i sur.: Medicinska biokemija i laboratorijska medicina u kliničkoj praksi, 2.	8	

dopunjeno i izmijenjeno izdanje. Zagreb:Medicinska naklada; 2018.		
Plavšić F., Žuntar I., Uvod u analitičku toksikologiju, Školska knjiga, Zagreb, 2007.	5	
Relevant scientific articles available online		Yes
<b>Further reading</b>		
Duraković Z. et al., Klinička toksikologija, Grafos, Zagreb 2000 Plavšić F., Žuntar I., Uvod u analitičku toksikologiju, Školska knjiga, Zagreb, 2007		
<b>Quality assurance methods that ensure the acquisition of exit competencies</b>		
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.		