

Course Unit Descriptor

<b>Study Programme:</b> MSc studies in Forensics		
<b>Course Unit Title:</b> Bioanalyses in Environmental Forensics		
<b>Course Unit Code:</b> FB-03		
<b>Name of Lecturer(s):</b> Associate professor Sonja Kaišarević		
<b>Type and Level of Studies:</b> Master Academic Degree		
<b>Course Status (compulsory/elective):</b> Elective		
<b>Semester (winter/summer):</b> summer		
<b>Language of instruction:</b> English		
<b>Mode of course unit delivery (face-to-face/distance learning):</b> face-to-face		
<b>Number of ECTS Allocated:</b> 6		
<b>Prerequisites:</b> None		
<b>Course Aims:</b> Presentation of different mechanisms of action of pollutants and bioanalyses as tools to determine their presence in the environment, estimate type and level of contaminants, and their potential effects on biological systems.		
<p><b>Learning Outcomes:</b></p> <p>After they successfully complete the course, students will be able to:</p> <ol style="list-style-type: none"> <li>1. apply different bioanalyses in environmental forensics;</li> <li>2. select relevant biomarkers and bioanalyses, depending on the type of contamination;</li> <li>3. interpret the results of bioanalyses, link them to the possible contaminants and sources of contamination, and estimate effects of contamination.</li> </ol>		
<p><b>Syllabus:</b></p> <p><i>Theory</i></p> <p>Introduction to environmental forensics. Contaminants in the environment (xenobiotics). Fate of xenobiotics in biological systems. Biotransformation of xenobiotics. Mechanisms of toxic action of xenobiotics. Effects of xenobiotics. Biomarkers in environmental forensics – definition and classification. Bioanalyses as tools for estimation of type and level of contamination and effects of xenobiotics. <i>In vivo</i> bioanalyses, bioanalyses on cell cultures, immunoanalyses. Bioanalyses in monitoring of xenobiotics: estimation of presence of persistent organic pollutants, dioxin-like compounds, endocrine disruptive compounds, metals. Laboratory toxicity tests. Effect-directed analyses. Analyses of case studies.</p> <p><i>Practice</i></p> <p>Presentation of bioanalyses on presence of different xenobiotics in the environment – practical aspects. Bioanalyses on cell cultures – cytotoxicity testing, microEROD analyses, gene expression analyses (demonstrations and independent practical work). Analyses and interpretation of the results – calculation of toxicity, definition of different response patterns, estimation of biological effects.</p>		
<p><b>Required Reading:</b></p> <ol style="list-style-type: none"> <li>1. Material provided by the lecturer</li> <li>2. Teodorovic I., Kaisarevic S. (2015) Ekotoksikologija. University of Novi Sad, Faculty of Sciences, Department of Biology and Ecology.</li> <li>3. Scientific papers in the field of environmental forensics.</li> <li>4. Literature in the field of environmental forensics available on-line.</li> </ol>		
<b>Weekly Contact Hours:</b> 5 (75)	<b>Lectures:</b> 3 (45)	<b>Practical work:</b> 2 (30)

**Teaching Methods:**

Lectures, discussions, seminars and student presentations, practical laboratory work, analyses of the results and calculations.

**Knowledge Assessment (maximum of 100 points):**

<b>Pre-exam obligations</b>	points	<b>Final exam</b>	points
Active class participation		written exam	60
Practical work	20	oral exam	
Preliminary exam(s)		.....	
Seminar(s)	20		

The methods of knowledge assessment may differ; the table presents only some of the options: written exam, oral exam, project presentation, seminars, etc.