

<b>Study Programme : MSc in Ecology</b>			
Degree level: Master degree			
<b>Course Title: Aquatic Toxicology</b>			
<b>Professor: Ivana Teodorovic</b>			
<b>Elective Course</b>			
<b>Number of ECTS: 6</b>			
<b>Prerequisites: -</b>			
<b>Course Objective:</b> Students get the solid knowledge on methods and techniques for monitoring and identification of key toxic pollutants causing stress in aquatic ecosystems, risk assessments and mitigation of aquatic ecosystems' ecological status decline as a consequence of toxic stress.			
<b>Course Outcome:</b> Successful students will be skilled to independently apply valid concepts and use current methods for monitoring and identification of key toxic pollutants, to understand the procedures used in environmental and ecological risk assessment in accordance with positive national and EU legislation.			
<b>Course Content:</b>			
<i>Theoretical part</i> Hazardous pollutants, priority pollutants, emerging substances endocrine disruptive chemicals, and nanoparticles in aquatic ecosystems and their mode of action. Methods for pollutants identification and prioritisation in aquatic environment. Mixture toxicity and models for prediction of mixture toxicity. Sediment as a repository and secondary source of pollution in aquatic ecosystems. Conceptual models for site specific sediment assessment: TRIAD approach (integration of chemical, ecotoxicological and biological sediment assessment methods), EDA (effect directed analysis) and alternative approaches to identification of aquatic toxic pollutants. Integrating in vivo, in vitro (specific biomarkers, ecotoxicogenomics), in situ and in silico (QSAR) models in retrospective monitoring of toxic pollutants in aquatic ecosystems. Passive sampling and dosing techniques. Regulatory aspect of aquatic toxicology: environmental quality standards (water, sediment, biota), environmental and ecological risk assessment, whole effluent toxicity assessment, sediment and dredged material assessment and characterisation.			
<i>Practical part</i> Sediment – contact toxicity tests. WET – whole effluent toxicity tests. Specific biomarkers used in EDA approach in identification and monitoring of key toxic pollutants in aquatic ecosystems. Methods used in TRIAD approach. Modelling in aquatic toxicology - QSAR. Models for prioritisation of aquatic toxic pollution.			
<b>Reading List:</b>			
1. Hoffman, D.J., Rattner, B.A., Burton, G.A. Jr., Cairns, J. Jr. (eds.) (2002): Handbook of Ecotoxicology. CRC Press, Lewis Publishers, Boca Raton, Florida, USA.			
2. Rand, G.M., Petrocelli, S.R. (1985): Fundamentals of Aquatic Toxicology. Hemisphere, New York.			
3. US EPA (United States Environmental Protection Agency). (1991a). Technical Support Document for Water Quality - Based Toxics Control. EPA/505/2-90-001			
4. US EPA (United States Environmental Protection Agency). (2006). ECOTOX database. <a href="http://www.epa.gov">www.epa.gov</a>			
<b>Total hours:</b>			
Lectures: 2	Practicals: 2	Other:	Student research work:5
<b>Methods of instruction:</b>			
Lectures, practical exercises, laboratory demonstrations, computing exercises, database and software practice, homework – essays and presentations			
<b>Assessment (maximum number of points 100)</b>			
<b>Requirements</b>	<b>points</b>	<b>Final exam</b>	<b>points</b>
Active participation in lectures		Written exam	
Active participation in practicals		Oral exam	50
Essay	50		
Pre-exam testing			