

Study Programme: Master Academic Studies in Chemistry - Quality Control and Environmental Management, Master Academic Studies in Environmental Protection - Environmental Protection Analyst			
Course Unit Title: Advanced Oxidation Processes			
Course Unit Code: IKK-510			
Name of Lecturer(s): Associate Professor Jelena Molnar Jazić			
Type and Level of Studies: Master of Science Degree			
Course Status (compulsory/elective): Elective			
Semester (winter/summer): Winter			
Language of instruction: English			
Mode of course unit delivery (face-to-face/distance learning): Face-to-face			
Number of ECTS Allocated: 6			
Prerequisites: None			
Course Aims: Students acquire knowledge in the field of advanced oxidation processes (AOPs) including theoretical knowledge about the oxidation mechanisms and application of AOPs in the environmental protection.			
Learning Outcomes: After successfully mastering the course, the student is able to apply knowledge about the advanced oxidation processes and explain the reaction mechanism in different applications in the field of environmental protection.			
Syllabus: <i>Theory</i> The most commonly applied advanced oxidation processes, their classification and mechanism of oxidation. Investigation the reaction mechanisms during the non-photochemical and photochemical advanced oxidation processes for the treatment of water, wastewater and soil contaminated with various organic and inorganic pollutants. Identification of specific degradation products. Application of advanced oxidation processes for the drinking water treatment. <i>Practice</i> Practical instructions are in compliance with theoretical instructions. Application of selected advanced oxidation processes (ozone-based advanced oxidation processes, Fenton process and UV-based AOPs) for the removal of natural organic matter and selected organic micropollutants from water. Identification of degradation by products in water. Comparing the efficacy of the applied AOPs and selection of optimal treatment for the specific case.			
Required Reading: 1. Kerry J. Howe, David W. Hand, John C. Crittenden, R. Rhodes Trussell, George Tchobanoglous: Advanced oxidation in: Principles of Water Treatment, John Wiley & Sons, 2012. 2. Simon Parson (Ed.): Advanced Oxidation Processes for Water and Wastewater Treatment, IWA Publishing, UK, 2004. 3. Steven L. Suib: New and Future Developments in Catalysis <i>Solar Photocatalysis</i> , Elsevier B.V., 2013.			
Weekly Contact Hours: 4	Lectures: 2	Practical work: 2	
Teaching Methods: Lectures, laboratory work and seminar			
Knowledge Assessment (maximum of 100 points): 100			
Pre-exam obligations	points	Final exam	points
Active class participation	10	Written exam	30
Practical work	20		
Seminar	10	Oral exam	20
Preliminary exam	10		