

Study Programme: Chemistry			
Course Unit Title: Green Chemistry and Ionic Liquids			
Course Unit Code: DSH-711			
Name of Lecturer(s): Full professor Slobodan Gadžurić, Associate professor Milan Vraneš			
Type and Level of Studies: PhD Studies			
Course Status (compulsory/elective): Elective			
Semester (winter/summer): Summer			
Language of instruction: English			
Mode of course unit delivery (face-to-face/distance learning): Face-to-face			
Number of ECTS Allocated: 15			
Prerequisites: None			
Course Aims:			
<ul style="list-style-type: none"> • Expanding knowledge and critical understanding of principles of green chemistry as one of the most modern chemistry disciplines and its application in contemporary analytical chemistry, organic and pharmaceutical synthesis, environmental protection and energy preservation and conservation. • Expanding students' knowledge of application of various modified analytical methods and techniques in accordance with green chemistry principles. • Expanding knowledge of green solvents and ionic liquids and their application in analytical chemistry and other fields of chemistry. 			
Learning Outcomes:			
<ul style="list-style-type: none"> • Explain significance of sustainability for the environment, • Independently choose the appropriate methodology and plan, design and conduct the necessary experiments in solving problems in new or unfamiliar multidisciplinary context. • Demonstrate independence and originality in decision-making in complex and unexpected situations. • Demonstrate ethical and social responsibility, professionalism, integrity and reliability in reporting on research results. • Successfully communicate with professionals from the same or different areas. 			
Syllabus:			
<i>Theory</i>			
Benign (green) solvents and reagents in chemical synthesis, industry, analytical procedures and separation techniques. Ionic liquids. Liquid-liquid extraction using the environmentally friendly solvents and ionic liquids. Green catalysis and biocatalysis. Sustainably energy sources. Energy storage. Application of analytical techniques in green chemistry.			
<i>Other forms of teaching</i>			
Review of the literature. Project preparation.			
Required Reading:			
1. Green Chemistry and Engineering Processes, Mukesh Doble, Anil Kumar Kruthiventi, Elsevier Inc., 2007.			
2. Ionic Liquids in Chemical Analysis, Edited by Mihkel Koel, CRC Press, 2009.			
3. Ionic Liquids IV-Not Just Solvents Anymore, Robin D. Rogers, editor, Joan F. Brennecke, editor, Kenneth R. Seddon, editor; American Chemical Society, Washington, DC, 2007.			
Weekly Contact Hours: 150	Lectures: 75	Practical work: 75	
Teaching Methods:			
Independent student work, solving of the practical problems			
Knowledge Assessment (maximum of 100 points): 100			
Pre-exam obligations	points	Final exam	points
Seminar work	30	Oral exam	70