



Study program: Doctoral Academic Studies in Biomedical Sciences		
Course title: PHARMACEUTICAL GREEN CHEMISTRY		
Teacher: Nevena N. Grujić-Letić, Branislava U. Srđenović Čonić, Slobodan B. Gadžurić, Milan B. Vraneš		
Course status: elective		
ECTS Credits: 20		
Condition: -		
Course aim The aim of the subject is to introduce to students modern concepts of pharmaceutical chemistry, green chemistry approaches and development, and green solvents – ionic liquids with major theoretical and practical application in pharmacy.		
Expected outcome of the course: Students are enabled to: demonstrate theoretical and practical knowledge in the field of pharmaceutical green chemistry; independently perform experiments in accordance with pharmaceutical green chemistry principles and evaluate potential environmental risks; apply ionic liquids in analysis and synthesis of pharmaceutical substances; independently make decisions in complex and unpredictable tasks; show ethical and social responsibility; communicate with professionals of the same or other scientific disciplines.		
Course description <i>Theoretical education</i> <ol style="list-style-type: none"> Efficient and economical chemical reactions in pharmacy Non-toxic (green) solvents in pharmaceutical synthesis, pharmaceutical industry, analytical techniques and separation methods in pharmacy Ionic liquids Liquid-liquid extraction with environmentally friendly solvents and ionic liquids Green catalysis and application of ionic liquids in catalysis Solvent toxicity Green analytical methods and techniques in pharmacy Novel methods of synthesis of the selected classes of pharmaceutical substances <i>Practical education</i> <ol style="list-style-type: none"> Literature overview Essay 		
Literature <i>Compulsory:</i> <ol style="list-style-type: none"> Ionic-Liquid-Based Aqueous Biphasic Systems - Fundamentals and Application, Mara G. Freire (Ed.), Springer Verlag Berlin Heidelberg, 2016. Handbook of Green Analytical Chemistry, Miguel de la Guardia, Salvador Garrigues, (Eds.), John Wiley & Sons, 2012. Green Chemistry and Engineering Processes, Mukesh Doble, Anil Kumar Kruthiventi, Elsevier Inc., 2007. Electronic database 		
Number of active classes	Theory: 60	Practices: 45
Teaching methods Theoretical and practical teaching.		
Student activity assessment (maximally 100 points) essay: 40 written exam: 60		