UNIVERSITY OF NOVI SAD
FACULTY OF MEDICINE

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, Emilia I. Gligorić, Branislava D. Teofilović

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 sinthesys of pharmaceutical substances; indenpendently make decisions in complex and unpredictable tasks; show ethical and social responsibility; communicate with proffesionals of the same or other scientific disciplines.

Course description

Theoretical education

1. Efficient and economical chemical reactions in pharmacy
2. Non-toxic (green) solvents in pharmaceutical synthesis, pharmaceutical industry, analytical techniques and separation methods in pharmacy
3. Ionic liquids
4. Liquid-liquid extraction with environmentally friendly solvents and ionic liquids
5. Green catalysis and application of ionic liquids in catalysis
6. Solvent toxicity
7. Green analytical methods and techniques in pharmacy
8. Novel methods of synthesis of the selected classes of pharmaceutical substances

Practical education

1. Literature overview
2. Essay

Literature

Compulsory:

1. Ionic-Liquid-Based Aqueous Biphasic Systems - Fundamentals and Application, Mara G. Freire (Ed.), Springer Verlag Berlin Heidelberg, 2016.
2. Handbook of Green Analytical Chemistry, Miguel de la Guardia, Salvador Garrigues, (Eds.), John Wiley & Sons, 2012.
3. Green Chemistry and Engineering Processes, Mukesh Doble, Anil Kumar Kruthiventi, Elsevier Inc., 2007.
4. 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