

Course Unit Descriptor

Study Programme: Bachelor Academic Studies in Biochemistry			
Course Unit Title: Bioorganic Chemistry			
Course Unit Code: B-401			
Name of Lecturer(s): Associate Professor Ivana Kovačević			
Type and Level of Studies: Bachelor of Science Degree			
Course Status (compulsory/elective): compulsory			
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: 9			
Prerequisites: None			
Course Aims: Acquiring new knowledge on the application of bio-active compounds, their analogues and model systems, for studying of fundamental biological processes.			
Learning Outcomes: Students will be trained to understand the fundamental mechanisms of biochemical processes and basic functions of complex biological systems, using modern chemical methods and selected naturally occurring or synthetic molecules.			
Syllabus: <i>Theory</i> Simple bioorganic mechanisms (the effects of proximity and orientation). Molecular recognition and supramolecular chemistry: bioorganic models of receptors, transporters and enzymes; supramolecular devices. Bioorganic chemistry of amino acids: enantioselective synthesis using chiral catalyst (homogeneous catalysis); asymmetric synthesis using chiral reagents; stereospecific synthesis based on the 'chiral pool' approach. Chemical synthesis of peptides and peptidomimetics: protective groups in the synthesis of peptides, methods for the formation of peptide bonds; Merrifield's solid-phase synthesis. Synthesis of nucleosides and analogues. Enzyme inhibitors of potential biomedical interest: structure, design and mechanism of action. <i>Practice</i> In accordance with theoretical instruction.			
Required Reading: 1. V. Popsavin: Fundamentals of Bioorganic chemistry, internal script (ePMF), 2019. 2. H. Dugas: <i>Bioorganic Chemistry – A Chemical Approach to Enzyme Action</i> , Third Edition, Springer-Verlag, New York, 1999. 3. A. Miller, J. Tanner, <i>Essentials of Chemical Biology</i> , John Wiley & Sons, Ltd. Chichester, 2008. 4. P. D. Beer, P. A. Gale, D. K. Smith: <i>Supramolecular Chemistry</i> , Oxford University Press, Oxford, 1999. 5. J. Jones: <i>Amino Acid and Peptide Synthesis</i> , Second Edition, Oxford University Press, Oxford, 2002.			
Weekly Contact Hours: 105	Lectures: 45	Practical work: 60	
Teaching Methods: Lectures, laboratory work, seminar(s)			
Knowledge Assessment (maximum of 100 points): 100			
Pre-exam obligations	points	Final exam	points
Active class	10	written exam	70

participation			
Practical work	10	oral exam	
Preliminary exam(s)		
Seminar(s)	10		

The methods of knowledge assessment may differ; the table presents only some of the options: written exam, oral exam, project presentation, seminars, etc.