

## Course Unit Descriptor

<b>Study program:</b> BSc in biology (Microbiology module)			
<b>Course Unit Title:</b> Molecular microbiology			
<b>Course Unit Code:</b> OB038			
<b>Name of Lecturer(s):</b> Ass. Prof. Milana Rakic, PhD; Ass. Prof. Dajana Blagojević, PhD; Ass. Prof. Verica Aleksić Sabo, PhD			
<b>Type and Level of Studies:</b> Bachelor's studies			
<b>Course Status (compulsory/elective):</b> compulsory			
<b>Semester (winter/summer):</b> winter			
<b>Language of instruction:</b> English			
<b>ECTS:</b> 5			
<b>Prerequisites:</b> -			
<b>Course Aims:</b> Acquaintance of students with the molecular basis of physiological processes that take place in the cells of microorganisms, as well as an introduction to the structure and function of macromolecules essential for the functioning of a prokaryotic cell.			
<b>Learning Outcomes:</b> Acquiring fundamental knowledge of the basics of molecular microbiology as well as familiarization with basic tools used in bioinformatics for microorganisms.			
<b>Syllabus</b>			
<i>Theory</i>			
1 Molecular information flow (Molecular biology and genetic elements, Replication, transcription and translation, Gene transfer in bacteria)			
2 Regulatory mechanisms of microorganisms (DNA binding proteins and transcriptional regulation, Signal transduction, Global regulatory mechanisms, RNA and regulatory mechanisms, Protein regulation)			
3 Molecular aspects of the growth of microorganisms (Bacterial cell division, Regulation of development in bacteria, Antibiotics and growth of microorganisms, Mutations).			
<i>Practice</i>			
Students will master the in silico methods necessary in microbiological research (designing primers, searching databases of interest, analyzing the obtained information, etc.). In addition, they will perform a practical analysis of the genome of microorganisms (DNA isolation, PCR detection of genes of interest).			
Students will be able to perform bioinformatic analysis and annotation of the genome of a selected microorganism using various tools of the Galaxy platform.			
<b>Required Reading:</b> Michael T. Madigan, Jennifer Aiyer, Daniel H. Buckley, W. Matthew Sattley, David A. Stahl (2021) Brock Biology of Microorganisms, Pearson.			
<b>Weekly teaching load</b>	<b>Lectures:</b> 2		<b>Practical lectures:</b> 2
<b>Teaching Methods:</b> Lectures with the use of computer presentations on a video projector, independent practical work of students and demonstration of certain molecular methods in microbiology, consultations.			
<b>Evaluation of knowledge (maximum score 100)</b>			
<b>Pre-exam obligation</b>	Points	<b>Final exam</b>	Points
Practical exam	20	Written exam	60
		Oral exam	20