

Study Programme: Biology and Ecology			
Course Unit Title: MICROBIAL ECOLOGY			
Course Unit Code: OE023			
Name of Lecturer(s): Dragan Radnović, full professor			
Type and Level of Studies: Bachelor 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: 5			
Prerequisites: pass the course of General microbiology			
Course Aims:			
To familiarize students with the role of microorganisms in the processes of circulation of matter and energy flow in nature.			
Learning Outcomes: Upon successful completion of the pre-exam and exam obligations, the student can:			
<ul style="list-style-type: none"> – Understand the role and significance of microorganisms in material cycling and energy flow processes in nature. – Explain the impact of various abiotic factors on the growth of microorganisms. – Describe the interactions between microorganisms and other microorganisms, plants, and animals. – Comprehend the application of ecological principles in controlling microbial growth and their use in environmental remediation 			
<p>Syllabus: <i>Theory</i> Historical Development of Environmental Microbiology. The term "microbiome" and the concept of the "biosphere" are defined through biogeochemical cycles involving the circulation of carbon, nitrogen, sulfur, phosphorus, and certain metals (Fe, Mn, Hg). The concept of ecological balance and the relationship of microorganisms to abiotic and biotic environmental factors are explored. Additionally, the interactions between microbial populations, microorganisms, plants, and animals are discussed. The distribution and significance of microorganisms in the atmosphere, hydrosphere, and pedosphere are also covered. Microbial communities, decomposition of natural materials, and the ecological factors controlling microbial growth, along with the fundamental principles of applying ecological concepts in biotechnology, are addressed.</p> <p><i>Practice-</i> Sampling for Microbiological-Ecological Investigations and Formation of Winogradsky Columns This study involves examining the prevalence of various physiological groups of microorganisms in water and soil. It includes determining the abundance and metabolic activity of specific physiological groups of microorganisms involved in the biogeochemical nitrogen cycle. Additionally, the quantification of ammonifiers, nitrifiers, and denitrifiers in soil samples is performed. Isolation of cellulose decomposers from plant material samples is also conducted. The impact of environmental factors on the growth of microorganisms isolated from different environments is explored, along with the isolation of potential antibiotic producers from soil .</p>			
Required Reading:			
Weekly Contact Hours:	Lectures:	Practical work:	
Teaching Methods:			
Knowledge Assessment (maximum of 100 points):			
Pre-exam obligations	points	Final exam	points
Active class participation	2	written exam	-
Practical work	22	oral exam	40
Preliminary exam(s)	36	
Seminar(s)	-		
The methods of knowledge assessment may differ; the table presents only some of the options: written exam, oral exam, project presentation, seminars, etc.			