

Course title	Environmental microbiology						
Code	ZDOI11						
Study	Postgraduate Interdisciplinary University Study Programme <i>Environment Protection and Nature Conservation</i>						
Semester	II						
ECTS	5						
Course state	General elective						
Professors	Doc. dr.sc. Ines Sviličić Petrić, assistant professor						
Colaborators	-						
Entrance conditions	-						
Aim	The goal of this course is to provide to the students basic knowledge on different groups microorganisms and their natural habitats, to provide a framework for understanding their key role in functioning of the whole ecosystems, biogeochemical cycling of major element and their possible catabolic role in transformation of xenobiotic compounds.						
Learning outcomes	<p>Course will provide to the students following learning outcomes:</p> <ol style="list-style-type: none"> 1. Learn about the field of Environmental Microbiology 2. Learn in general about different groups of microorganism and get acquainted with the tools used for studying them in their natural systems 3. Learn about functioning and metabolism of microorganism in their natural environments 4. Learn about the role of microorganisms in biogeochemical cycles 5. Learn about the catabolic potential of microorganism in the transformation of organic pollutants and possible application in bioremediation techniques 6. Based on this knowledge students will be able to write paper in the form of a seminar on the given topic covered by the field of environmental microbiology. 						
Connections between students activity, learning outcomes and evaluation	Students activity	ECTS	Learning outcomes	Course activity	Evaluation methods	Points*	
						min	max
	Active participation		1-5	Lecture	-		
	Active participation		1-6	Seminar	Writing seminar		
	Preparation for the exam		1-6		Oral exam		
Total	6						
Consultations	Cosultation will be provided according to the students need						
Teaching form	Lectures		Seminars		Exercises		
No. of hours	15		-		-		
Content	<ul style="list-style-type: none"> • Getting acquainted with the topic of the Environmental Microbiology • Who are microorganisms, what are their basic characteristics and what are the methods and techniques used for studying them in natural systems • What are natural habitats of different microorganisms: (i) microorganisms in freshwater and marine environments, (ii) microorganisms in soil, (iii) microorganisms in extreme environments • How are environmental physical-chemical parameters affecting the growth and behavior of microorganisms in the environment • What types of interactions exist between microorganisms. What types of interactions exist between microorganisms and higher organisms (plants and animals) 						

	<ul style="list-style-type: none"> • What is the role of microorganisms in biogeochemical cycling of major elements • What is the role of microorganisms in transformation of organic xenobiotic compounds. Application of microorganism in bioremediation of the environment
Compulsory literature	<p>Maier, R. M., Gerba, C. P. and Pepper, I. L. (eds.): Environmental Microbiology. Academic Press, Inc. 1999</p> <p>Varnam, A. H. and Evans, M. G. (eds.): Environmental Microbiology. Manson Publishing Ltd, London, 2000</p>
Optional literature	<p>Bitton, G. (ed.): Wastewater Microbiology, 2nd Ed. John Wiley and Sons Inc. New York, 1999.</p> <p>Alexander, M.: Biodegradation and Bioremediation, 2nd ed. Academic Press, Inc. 1999.</p> <p>Rittmann, B.E. and McCarty P.L.: Environmental Biotechnology – Principles and Applications. The McGraw-Hill Companies, Inc. 2001</p> <p>- all literature on the topic of microbial and environmental microbiology</p>
Completion condition	Active participation in the course or on consultations, writing seminar paper on the given topic
Exam form	Written seminar paper and oral exam
Possible teaching languages	Croatian and English
Form of quality monitoring	student questionnaire