

<b>Title</b>	<b>Soil microbiology</b>						
<b>Code</b>	ZDIP47						
<b>Study Program</b>	Postgraduate Interdisciplinary University Programme Environment protection and Nature Conservation						
<b>Semester</b>	III.						
<b>ECTS</b>	5						
<b>Status</b>	<u>elective</u>						
<b>Lecturer</b>	full professor PhD Suzana Kristek						
<b>Co-Lecturers</b>							
<b>Requirements for Enrolment</b>	Enroll postgraduate study program						
<b>Objectives</b>	Get Ph. D students acquainted with the latest soil microbiology knowledge focusing on microbiocenotic populations significant in biotechnology and sustainable agriculture.						
<b>Learning Outcomes</b>	<p>After completing the modul, student will be able to:</p> <ol style="list-style-type: none"> <li>1. Classify and compare soil microorganisms.</li> <li>2. To determine the importance and impact of pedofauna on soil fertility and plant production.</li> <li>3. To integrate the processes of microbial metabolism and metabolic differences between soil microorganisms.</li> <li>4. Anticipate the impact of cultural practices on the biodiversity of the soil.</li> <li>5. Assess the importance and role of beneficial soil microorganisms.</li> <li>6. Recommend and applied microbiological preparations depending on the environmental conditions.</li> </ol>						
<b>Connection between Learning Outcomes, Curricular and Student Activities</b>	<b>Student Activities</b>	<b>ECTS</b>	<b>Learning Outcomes</b>	<b>Curricular Activities</b>	<b>Methods of Assessment</b>	<b>Credits*</b>	
						<b>min</b>	<b>max</b>
	Presence in lectures with active participation	0,4	1-6	Lectures	Evidence of presence, evaluation	5	15
	Presence in exercises with active participation	0,2	1-6	exercises	Evidence of presence, colloquium	10	20
	Preparation of written exam	2,2	1-6	Knowledge test	Written exam	30	40
	Preparation of oral exam	2,2	1-6	Final exam	Oral exam	15	25
	<b>Ukupno</b>	<b>5</b>				<b>60</b>	<b>100</b>
<b>Consultations</b>	Once a week 2h, further, if necessary, in consultation with students.						
<b>Learning Activities</b>	<b>Lectures</b>		<b>Seminars</b>		<b>Practice</b>		
<b>Hours</b>	10				5		
<b>Contents / Teaching Units</b>	Soil ecosystem - physical and chemical characteristics. Biological participants: bacteria, actinomycetes, fungi, algae, protozoa, viruses. Microbial diversity of ecosystems. Energy transformation and metabolic activity of soil microorganisms. Microbiological processes – cycles of the most essential elements in nature. Nitrogen cycle. Sulfur cycle. The cycle of phosphorus. Biological nitrogen fixation. Microbiological interactions, the development of their communities and their adaptability. Biotechnology in agriculture - current concepts.						

<b>Obligatory Literature</b>	<p>Tate, R.L. 2000: Soil Microbiology. Wiley, New York, USA.</p> <p>Subba Rao, N.S. 2001: Soil Microbiology. Science Publishers, Inc., USA.</p> <p>Varnam, A.H., Evans, M.G. (ed.) 2000: Environmental Microbiology. Manson Publishing Ltd, London.</p> <p>van Elsas, J.D., Trevors, J.T., Wellington, E.M. H. 1997: Modern Soil Microbiology. Marcel Dekker Inc., New York, USA.</p> <p>Alef, K., Nannipieri, P. (1995): Methods in Applied Soil Microbiology and Biochemistry. Academic press Inc, San Diego.</p>
<b>Recommended literature</b>	<p>Tomphins, P., Bird, C. 1998: Tajni život tla. Prosvjeta, 1998., Zagreb.</p> <p>Sylvia, D. M., Fuhrmann, J.J., Hartel, P.G., Zuberer, D.A. (2004): Principles and Applications of Soil Microbiology. Prentice Hall Inc, New York.</p> <p>Varma, A., Oelmüller, R. 2007: Advanced Techniques in Soil Microbiology. Springer.</p>
<b>Requirements for Aquiring Signature</b>	Students are required to actively participate in class and perform all tasks.
<b>Type of Exam</b>	Students' work will be monitored during the classes where the professor will evaluate the completed tasks. After that, students can take the final exam. Students are advised to prepare exams from the obligatory literature.
<b>Lectures Language</b>	Croatian
<b>Quality Monitoring</b>	The evaluation of professors and the quality of the modules via anonymous student questionnaire.