



“ECOLOGICAL MICROBIOLOGY” SYLLABUS

Basic data of the subject			
Academic Unit:	Faculty of Life and Environmental Sciences		
Course title:	Ecological microbiology		
Program:	Forest and Environmental Sciences		
Level:	Bachelor		
Course status:	Selective		
Study year:	Second year, second semester		
Number of hours per week:	2+1		
Credit value – ECTS:	3		
Time / location:	To be announced		
Lecturer:	Prof. asoc. dr. Albana Plakiqi Milaimi		
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Course description:	<p>At the beginning of the course will be introduction the soil microbiology. Then, will be recognize with the microorganism’s habitat, metabolism and genetics, including Bacteria, Fungi, Cyanobacteria, soil algae, soil Fauna and Viruses. Special chapter will be the Microbial ecology, when will explain the Rhizosphere and Mycorrhiza symbioses. Will be discuss about materia circulation in environment, where we will also discuss the global gas emissions. Special emphasis will be given to the Microbiology and biochemistry of xenobiotic compounds degradation; Bioremediation of contaminated soils, and Biological control of soil plant pathogens and nematodes. In the last chapter will be discus the organic composing of wastes.</p>		
Course objectives:	<p>The main objective of this course is to provide students the basic knowledge from microbiology of the soil and the importance of microorganisms in soil composition, in the material circulation, especially, in environmental pollutants destroying.</p>		
Learning outcomes:	<p>Upon completion of this course, students will be able to:</p> <ol style="list-style-type: none"> 1. Recognize the microorganisms in general. 2. Recognize the procedures and techniques used to detect and count microorganisms. 3. Analyze the problems and issues related to soil microorganisms. 4. Integrate their knowledge base linking of the microbiology in general and the soil microbiology in particular. 5. Understand the metabolism of microorganisms and processes of transformation of nitrogen and phosphorus. 		
Contribution on student load (must correspond with learning outcomes)			
Activity	Hours	Days/week	Total
Lectures	2	15	30



Exercise theoretical/laboratory	1	20	20
Practice work			
Contact with lecturer/consultations	2/semester	-	2
Field exercises			
Mid-terms, seminars	2/semester	-	2
Homework			
Individual time spent studying (at the library or home)	1	15	15
Final preparation for the exam	2/semester	-	2
Time spent in evaluation (tests, quiz, final exam)	2/semester	-	2
Projects, presentations, etc.	2/semester	-	2
Total			75 hours
Teaching methods :	Lecture, discussions, laboratory exercises, consultations, seminars, individual research and teaching, partial exam, final exam.		
Evaluation methods:	First evaluation: 20%, second evaluation: 20%, Seminars and other activities: 5 %, Regular attendance: 5%, Final exam: 50%. Total 100%.		
Literature			
Basic Literature:	<ol style="list-style-type: none"> 1. Albana Milaimi, 2018. Mikrobiologjia ekologjike. Skriptë me përmbledhje ligjëratash për nevojat e studentëve të Shkencave të pyjeve dhe mjedisit. 2. C.J Hurst: Manual of Environmental Microbiology, 2nd ed. (2002), American Society for Microbiology Press, Washington, DC. 		
Additional Literature:	<ol style="list-style-type: none"> 3. D. Sylvia, J. Fuhrmann, P. Hartel and D. Zuberer, Eds: Principles and Applications of Soil Microbiology, 2nd Edition,.Prentice Hall, 2005. 4. M.T. Madigan, J.M. Martinko, and J. Parker: Biology of Microorganisms, 12th (2008), 11th (2006), or 10th (2003) editions, Pearson Education, Inc., Upper Saddle River, NJ. 5. Muje Plakolli: Mikrobiologjia e përgjithshme. Universiteti i Prishtinës, Prishtinë, Kosovë, 1996. 		

Designed study plan:		
Week	Lectures	Exercises
<i>First week:</i>	Soil microbiology	Aseptic Techniques: Mediums and laboratory equipment for microbiology work



<i>Second week:</i>	Habitates. Metabolism of microorganisms.	Physical factors that influence the development of microorganisms
<i>Third week:</i>	Genetics of microorganisms.	Chemical factors that influence the development of microorganisms
<i>Fourth week:</i>	Viruses, Bacteria, Fungi.	Determination of fatty acids of oral bacteria (streptococci) with liquid chromatography
<i>Fifth week:</i>	Cyanobacteria and soil algae.	Techniques for planting of bacterial cultures
<i>Sixth week:</i>	Terrestrial fauna.	Microbiological examination of food items
<i>Seventh week:</i>	Eology of microorganisms. Rhizosphaera, symbiosis. First intermediary assessment	Some morpho-physiological characteristics of bacteria which cause food spoilage
<i>Eighth week:</i>	Carbon cycle and soil organic formation.	Methods of bacterial dilution and planting as well as growth curves
<i>Ninth week:</i>	Nitrogen transformaion. Biological fixation of nitrogen.	Determination of soil sample composition
<i>Tenth week:</i>	Symbiotic and non symbiotic of nitrogen fixation.	Examination of Soil Microorganisms Via Microscopic and Cultural Assays
<i>Eleventh week:</i>	Sulphur and phosphorous transformation.	Determination of Filamentous Fungi
<i>Twelfth week:</i>	Global gases.	Determination of Bacteria and Actinomycetes
<i>Thirteenth week:</i>	Microbiology and biochemistry of xenobiotic compound degradation.	Oxidation of Sulfur in Soil
<i>Fourteenth week:</i>	bioremediation of polluted soils.	Dehydrogenase Activity of Soils
<i>Fifteenth week:</i>	Biological controul of soil with plant pathogens and nematodes. Organic composition of wastes. Second intermediary assessment	Nitrification and Denitrification
Academic policies and rules of conduct:		
Regular and active participation of students in lectures, exercises (practical part) and seminar work. Keeping the peace in learning, the disconnection of mobile phones, entry hall time learning etc.		