



“FOREST PATHOLOGY” SYLLABUS

Basic data of the subject	
Academic Unit:	Faculty of Life and Environmental Sciences
Course title:	Forest Pathology
Program:	Forest and environment sciences
Level:	Bachelor (BSc)
Course status:	Compulsory
Study year:	II
Number of hours per week:	2+2
Credit value – ECTS:	5
Time / location:	To be announced
Lecturer:	Prof. ass. dr. Fadil Musa
Contact details:	fadil.musa@uni-pr.edu
Course description:	<p>Within the framework of the Forests Pathology will be explained the history, development, concept and classification of diseases and diseases symptoms. Taxonomy of fungi, bacteria and phytopathogenic viruses. Biological features of fungi, bacteria and phytopathogenic viruses. Stages of disease development and the impact of ecological factors on pathogenesis. Abiotic diseases. Diseases caused by abiotic factors (food disorders, environmental stress, air pollution, etc.). Typical damages and symptoms caused by pathogens: fungi, bacteria, viruses in forest crops. Reproduction of pathogens, their spread and transmission. Different diseases of forest cultures, their description and preventive and control measures. The most important groups of fungicides, quarantine and regulations related to plant diseases, detailed presentation (morphology, symptoms, ecology, opportunities of a forestry experts to take measures) of about 50 diseases of forest crops, which are grouped in related to affected plant parts: Seed and seed disease, root disease, leaf and stem disease, stump and branch disease, trunk diseases, parasitic plants, non-parasitic disorders and wood degradation and discoloration. In addition, the student will be informed about mycorrhiza and the importance of fungi as a source of food, their role in a forest ecosystem, as well as regulations regarding their use.</p>
Course objectives:	<p>The course aims to provide students with theoretical and practical knowledge of pathogens that cause disease in forest crops and measures for their management.</p> <p>Through this course, students will gain knowledge of pathogens as pests of forest cultures, morphology, anatomy, physiology, ecology and biology of pathogens as pests in general.</p> <p>Specifically, this course will clarify how recognition of biology of pathogens will help protect forests crops. Throughout the course, random studies will be used to encourage discussion and help students increase their ability to formulate a successful pathogen management program.</p>



Learning outcomes:	<p>Upon completion of this course, students will be able to:</p> <ol style="list-style-type: none"> 1. Know basic elements related to the pathogenic causes of forest diseases. 2. Understand the ways of occurrence, distribution and multiplication of pathogens that causes forest diseases. 3. Understand the symptoms of diseases and the ways of overwintering of the pathogens. 4. Apply the gained knowledge into the praxis. 		
Contribution on student load (must correspond with learning outcomes)			
Activity	Hours	Days/week	Total
Lectures	2	15	30
Exercise theoretical/laboratory	2	10	20
Practice work	3	8	24
Contact with lecturer/consultations	1	4	4
Field exercises	8	1	8
Mid-terms, seminars	2	3	6
Homework	2	4	8
Individual time spent studying (at the library or home)	2	6	12
Final preparation for the exam	2	2	4
Time spent in evaluation (tests, quiz, final exam)	2	2	4
Projects, presentations, etc.	1	5	5
Total			125
Teaching methods :	<p>This is a Combined Lectures-Exercises course in which topics are presented by the Subject Professor. Practical parts, laboratory activities and excursions are explained by the professor and the assistant of the subject. In general lecture presentations will be made through Power Point. Additional materials will be provided by the Professor. Regular attendance in lectures and practical exercises is mandatory.</p> <p>Knowledge verification will be performed after the end of learning cycles. After completing the lectures is part of the mandatory testing through the final colloquium and the oral exam.</p>		



	The ratio between the theoretical and practical part of the study is: 50% : 50%.
Evaluation methods:	Student assessment is done by assigning the percentage of participation of each assessment during the exercises to the final evaluation. First assessment (colloquium): 15%, Workshops or other commitments: 10%, Regular attendance: 5%, Final exam: 70%, Total: 100%.
Means of concretization	In general, lecture presentations will be via Power Point. Additional materials will be provided by the Professor. Regular attendance at lectures and practical exercises is mandatory.
Ratio between theoretical and practical part of the study	Ration between theoretical and practical part of the study is: 50% : 50%
Literature	
Basic Literature:	<ol style="list-style-type: none"> 1. Kalatani T. 1989: Mbrojtja e pyjeve – Fitopatologjia. 2. Ushamalini C, Saravanakumar D. 2013: Hand Book On Forest Pathology. LAP LAMBERT Academic Publishing. 3. John E. Lundquist and Richard C. Hamelin. 2005: Forest Pathology: From Genes to Landscapes. APS PRESS. 4. Strange, R. 2003: Introduction to Plant Pathology. John Wiley & Sons Ltd. The Atrium, Southern Gate, Chichester, West Sussex PO19 8SQ, England. 5. Susuri, L. 2004: Fitopatologjia. Universiteti i Prishtinës 6. Trigiano, R., Windham, M. & Windham, A. 2004: Plant Pathology. Concepts and Laboratory Exercises. Boca Raton London New York Washington, D.C.
Additional Literature:	<ol style="list-style-type: none"> 7. Agrios, G. 2005: Plant Pathology. Fifth Edition. Department of Plant Pathology University of Florida. 8. Andrews H. & Tommerup, I. 1995: Advances in Plant Pathology. Department of Plant Pathology. The University of Wisconsin Madison, Wisconsin USA. 9. Sinclair, W.A., Lyon, H.H., Johnson, W.T. 1987. Diseases of Trees and Shrubs. Comstock Publ. Assoc., Cornell U. Press, Ithaca, N.Y., 574 str.

Designed study plan:		
Week	Lectures	Exercises
<i>First week:</i>	History, development and concept of forestry pathology. Classification of diseases in forest crops.	The triangle of diseases, pathogenesis and stages of disease development.
<i>Second week:</i>	Taxonomy of fungi, bacteria and phytopathogenic viruses.	Fungi, their structure, construction and propagation.
<i>Third week:</i>	Biological features of fungi, bacteria and viruses.	Inoculation, inoculums, pathogens penetration into plant cells and infection.



<i>Fourth week:</i>	Stages of disease development and impact of ecological factors on pathogenesis.	The cycle of the diseases development caused by fungi.
<i>Fifth week:</i>	Diseases caused by abiotic factors (food disorders, environmental stress, air pollution, etc.).	The type of the spores of the fungi and their spread.
<i>Sixth week:</i>	Typical damages and symptoms caused by pathogens: fungi, bacteria, viruses in forest crops.	Sistematic of fungi (Oomycetes, Zygomycetes, Ascomycetes, Basidiomycetes dhe Deutoro mycetes).
<i>Seventh week:</i>	Reproduction of pathogens, their spread and transmission. First intermedium evaluation	Bacteria, their structure, construction and propagation.
<i>Eighth week:</i>	Forms of overwintering, spreading and conservation of pathogens.	Classification of bacteria and their characteristics.
<i>Ninth week:</i>	Different diseases of forest cultures, their description and preventive and control measures.	The cycle of disease development caused by bacteria.
<i>Tenth week:</i>	Seed and seedlings diseases, root disease, leaf diseases.	Viruses, their structure, construction and reproduction.
<i>Eleventh week:</i>	Trunk and branch diseases, wilting diseases, parasitic plants, non-parasitic disorders, wood degradation and discoloration.	Preparation of nutrition media for the isolation of pathogens (fungi and bacteria).
<i>Twelfth week:</i>	Mycorrhiza and the importance of mushrooms as a source of food, their role in a forest ecosystem, as well regulations regarding their use.	Isolation and determination of pathogens from infected plant material (leaves, sprouts, flowers, etc.).
<i>Thirteenth week:</i>	The most important groups of fungicides quarantine and regulations related to plant diseases.	Isolation of bacteria from infected plant material.
<i>Fourteenth week:</i>	Plant Quarantine and regulations related to plant diseases.	Serologic methods for viruses determination (Elisa Test).
<i>Fifteenth week:</i>	Measures, methods and ways of fighting pathogens. Second intermedium evaluation	The colloquium in written from the part exercises.
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.		