Basic data of the subject FOREST PATHOLOGY	
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. Asoc. dr. Fadil Musa
Contact details:	fadil.musa@uni-pr.edu
Course description:	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 sting 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.
Course objectives:	The main objective of the course is to provide students with theoretical and practical knowledge about pathogens that cause diseases in forest crops and measures for their management. Through this course, students will gain knowledge about pathogens as pests of forest crops, morphology, anatomy, physiology, ecology and biology of pathogens as pests in general. Specifically, this course will clarify how knowledge of pathogen biology will help protect forest crops. Case studies will be used throughout the course to stimulate discussion and assist students in developing the ability to formulate a successful pathogen management program
Learning outcomes:	Upon completion of this course, students will be able to: 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 :	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. 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. The ratio between the theoretical and practical part of the study is: 51:1 (2+2)
Evaluation methods:	Students' assessment will be based on their attendance and commitment, written assignments, mid-term exam and final exam. First assessment (colloquium): 15%, Seminars or other engagements: 10%, Regular attendance: 5%, Final exam: 70%, Total: 100%. Passability criteria are based on the decision of the

	Faculty Council, presented above in the Self-Evaluation Report (SER).
Means of concretization	Computers, projector, equipment and laboratory tools, as well as additional materials that will be provided by the professor and the subject assistant
Ratio between theoretical and practical part of the study	Ration between theoretical and practical part of the study is: 50% : 50%
Literature	
Basic Literature:	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. 7. Doracak për dëmtuesit kryesorë të pyjeve në Europën juglindore (fao.org) (2014)
Additional Literature:	8. Agrios, G. 2005: Plant Pathology. Fifth Edition. Department of Plant Pathology University of Florida. 9. Andrews H. & Tommerup, I. 1995: Advances in Plant Pathology. Department of Plant Pathology. The University of Wisconsin Madison, Wisconsin USA. 10. 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. 11. Prospero, S., Conedera, M., Heiniger, U. and Rigling, D. (2006) Saprophytic activity and sporulation of Cryphonectria parasitica on dead chestnut wood in forests with naturally established hypovirulence. Phytopathology, 96, 1337–1344. 12. Meyer, J.B., Gallien, L. and Prospero, S. (2015) Interaction between two invasive organisms on the European chestnut: does the chestnut blight fungus benefit from the presence of the gall wasp? FEMS Microbiol. Ecol. 91, fiv122. 13. Prospero, S., Conedera, M., Heiniger, U. and Rigling, D. (2006) Saprophytic activity and sporulation of Cryphonectria parasitica on dead chestnut wood in forests with naturally established hypovirulence. Phytopathology, 96, 1337–1344. 14. Gross, A., Holdenrieder, O., Pautasso, M., Queloz, V. and Sieber, T.N. (2014) Hymenoscyphus pseudoalbidus, the causal agent of European ash dieback. Mol. Plant Pathol. 15, 5–21. 15. Prospero, S. and Rigling, D. (2013) Chestnut blight. In: Infectious Forest Diseases (Gonthier, P. and Nicolotti, G., eds), pp. 318–338. Wallingford: CAB International.

Designed study plan:

Week	Lectures	Exercises
First week:	History, development and concept of forestry pathology. Classification of diseases in forest crops.	The triangle of diseases, pathogenesis and stages of disease development.
Second week:	Taxonomy of fungi, bacteria and phytopathogenic viruses.	Fungi, their structure, construction and propagation.
Third week:	Biological features of fungi, bacteria and viruses.	Inoculation, inoculums, pathogens penetration into plant cells and infection.
Fourth week:	Stages of disease development and impact of ecological factors on pathogenesis.	The cycle of the diseases development caused by fungi.
Fifth week:	Diseases caused by abiotic factors (food disorders, environmental stress, air pollution, etc.).	The type of the spores of the fungi and their spread.
Sixth week:	Typical damages and symptoms caused by pathogens: fungi, bacteria, viruses in forest crops.	Sistematic of fungi (Oomycetes, Zygomycetes, Ascomycetes, Basidiomycetes dhe Deutoro mycetes).
Seventh week:	Reproduction of pathogens, their spread and transmission. **First intermedium evaluation**	Bacteria, their structure, construction and propagation.
Eighth week:	Forms of overwintering, spreading and conservation of pathogens.	Classification of bacteria and their characteristics.
Ninth week:	Different diseases of forest cultures, their description and preventive and control measures.	The cycle of disease development caused by bacteria.
Tenth week:	Seed and seedlings diseases, root disease, leaf diseases.	Viruses, their structure, construction and reproduction.
Eleventh week:	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).
Twelfth week:	Mycorrhiza and the importance of mushrooms a source of food, their role in a forest ecosystem, a well regulations regarding their use.	Isolation and determination of pathogens from infected plant material (leaves, shoots, flowers, etc.) – study Cryphonectria parasitica and other parasitic fungi.
Thirteenth week:	The most important groups of fungicides quarantine and regulations related to plant diseases.	Isolation of bacteria from infected plant material.
Fourteenth week:	Plant Quarantine and regulations related to plant diseases.	Serologic methods for viruses determination (Elisa Test).
Fifteenth week:	Measures, methods and ways of fighting pathogens. **Second intermedium evaluation**	The colloquium in written from the part exercises.

Academic policies and rules of conduct:
▪ Students should be aware of and respect the institution and Code of ethics (English-Kodi-Etikes-per-Student.pdf (uni-prizren.com) ▪ Students should respect the schedule of lectures, and exercises and be attentive. ▪ It is mandatory to possess and presents a student ID card in the mid-terms and exam, ▪ During the compilation of course projects, students must adhere to the instructions given by the professor. ▪ During the exam is forbidden the use of mobile phones.