



COURSE SYLLABUS „FOREST CHEMISTRY”

Basic data of the subject	
Academic Unit:	Faculty of Life and Environmental Sciences
Course title:	Forest chemistry
Study program:	Forestry and Environmental Sciences
Level:	Bachelor
Course status:	Obligatory
Study year:	first year
Number of hours per week:	3+2
Credit value – ECTS:	6
Time / location:	Will be appointed by the Faculty
Lecturer:	Prof. Dr. Fatmir Faiku
Contact details:	fatmir.faiku@uni-pr.edu Tel: 044 261 366
Course description:	Chemical and mineralogical composition of soils, The mineralogical composition of clay and their role, The essential composition of soils and the circulation of elements in nature, Earth colloids and their sorption, Characteristics of the most important sorbing mechanisms from the ground, Sorption of cations on earth and its laws, Sorption of anions on the ground and sorption patterns, Land reactions, acidification of the soil, Methods and their treatment, Land selection and soil study methods, Salty lands, Soil airing, Strategy for land protection-preservation from acidification, salinity and soil contamination in Kosovo and the EU, Enzymes, Classification, Characteristics, Composition, Coenzymes, Enzymatic Kinetics, Inhibitory, Photosynthesis, Exogenous and Endogenous Factors Affecting Photosynthesis, Bright Stage of Photosynthesis, ATP Formation, Dark Photosynthesis Stage, Photosynthesis Effectiveness, Breathing, Glycolysis, Anaerobic Fermentation, Krebs Cycle, Electronic Transport Chain. Lipids, Metabolism of fatty acids, Nitrogen Cycle, Nitrogen Fixation, Mineralization, Glutamine Biosynthesis, Amino acids and proteins, Secondary Metabolism, Phenol Biosynthesis, Pectin, Cellulose, Aromatic Amino Acids and Lignin.
Course objectives:	This course will equip students with the ability to explain how solid soil stages affect the chemical processes of the soil system. Knowing such processes will give students an understanding of what processes dominate the chemical and mineralogical properties of lands and that will help in land repossession, recovery and management decisions. At the same time, students will be introduced to some enzymatic and biochemical mechanisms of plants.
Learning outcomes:	The main purpose of the course is to transfer to students: <ul style="list-style-type: none"> ✓ Basic knowledge of soil chemistry. ✓ Basic knowledge on laboratory methodologies for determining some physico-chemical characteristics of the soil. ✓ Basic knowledge of some enzymatic and biochemical mechanisms of plants.



	<ul style="list-style-type: none"> ✓ The knowledge gained is useful for a better understanding of other processes and phenomena related to plant physiology and production. ✓ To develop sufficient theoretical and practical knowledge. ✓ To be independent for laboratory work. 		
Contribution on student load (must correspond with learning outcomes)			
Activity	Hours	Days/week	Total
Lectures	3	15	45
Exercise theoretical/laboratory	2	15	30
Practice work			
Contact with lecturer/consultations	2	7	14
Field exercises			
Mid-terms, seminars	2	3	6
Homework			
Individual time spent studying (at the library or home)	2	7	14
Final preparation for the exam	18	2	36
Time spent in evaluation (tests, quiz, final exam)	1	4	5
Projects, presentations, etc.			
Total			150 orë (6 ECTS)
Teaching methods:	Lectures, discussions, practical exercises in the lab, consultations, independent projects, homework assignments, colloquia, exams.		
Assessment methods:	The first evaluation: 20%, The second evaluation: 20%, Seminars or other engagements: 10%, Final exam: 50%, Total: 100%		
Literature			
Basic Literature:	<ol style="list-style-type: none"> 1. M. E. Essington, Soil and Water Chemistry: An integrated approach, 2003. 2. Various Authors, Agricultural Biochemistry, Patron Editore, 2003. 		
Additional Literature:	<ol style="list-style-type: none"> 1. Alqi Çullaj, Kimia e mjedisit, Tiranë, 2005. 2. Nexhat Daci, Majlinda Daci, Shkenca e mjedisit: Zhvillimi i qëndrueshëm, Prishtinë, Akademia e Shkencave dhe e Arteve e Kosovës, 2014. 3. Sabit Dërmaku, Biokimia, Prishtinë, 2007. 		



Designed study plan		
Week	Lectures	Exercise
<i>First week:</i>	Chemical and mineralogical composition of soils, The mineralogical composition of clay and their role.	Determination pH in the soil.
<i>Second week:</i>	The essential composition of soils and the circulation of elements in nature.	Determination of N, S, P etc.
<i>Third week:</i>	Earth colloids and their sorption. Characteristics of the most important sorbing mechanisms from the ground.	Determination of chlorides (in HNO ₃) by Volhard method.
<i>Fourth week:</i>	Sorption of cations on earth and its laws, Sorption of anions on the ground and sorption patterns.	Determination of some heavy metals in the soil by the SAA method.
<i>Fifth week:</i>	Land reactions, acidification of the soil, Methods and their treatment.	Determination of some heavy metals in the soil by the SAA method.
<i>Sixth week:</i>	Land selection and soil study methods, Salty lands.	Determining As, Bi, Sb, Sn, Te with hydruze technique.
<i>Seventh week:</i>	Soil airing, Strategy for land protection-preservation from acidification, salinity and soil contamination in Kosovo and the EU.	Determining As, Bi, Sb, Sn, Te with hydruze technique.
<i>Eighth week:</i>	The first assessment	Extraction of lipids from various medicinal plants.
<i>Ninth week:</i>	Enzymes, Classification, Characteristics, Composition, Coenzymes, Enzymatic Kinetics, Inhibitory.	Extraction of lipids from various medicinal plants.
<i>Tenth week:</i>	Photosynthesis, Exogenous and Endogenous Factors Affecting Photosynthesis, Bright Stage of Photosynthesis, ATP Formation, Dark Photosynthesis Stage, Photosynthesis Effectiveness.	Determination proteins with the Kjeldahl method
<i>Eleventh week:</i>	Breathing, Glycolysis, Anaerobic Fermentation, Krebs Cycle, Electronic Transport Chain. Lipids, Metabolism of fatty acids.	Determination proteins with the Kjeldahl method
<i>Twelfth week:</i>	Nitrogen Cycle, Nitrogen Fixation, Mineralization, Glutamine Biosynthesis.	Isolation of essential oils from plants by steam distillation.
<i>Thirteenth week:</i>	Amino acids and proteins.	Isolation of essential oils from plants by steam distillation.
<i>Fourteenth week:</i>	Secondary Metabolism, Phenol Biosynthesis, Pectin, Cellulose, Aromatic Amino Acids and Lignin.	Identification of amino acids.
<i>Fifteenth week:</i>	The second assessment	Identification of peptide bond.
Academic policies and rules of conduct:		



Students are obliged to attend lectures regularly, to take part in field study tours (excursion). Disconnection of mobile phones, timely access to the classroom and keeping quiet during the lecture hours are also mandatory.