

<b>Basic data of the subject</b>	
<b>Academic Unit:</b>	<b>University of Prizren „ Ukshin Hoti” Faculty of Life and Environmental Science</b>
<b>Department</b>	<b>Forestry and Environmental Sciences</b>
<b>Program</b>	<b>Forestry and Environmental Sciences</b>
<b>Course title:</b>	<b>Forest pedology</b>
<b>Level:</b>	<b>Bachelor</b>
<b>Course status:</b>	<b>Compulsory</b>
<b>Study year:</b>	<b>First year</b>
<b>Number of hours per week:</b>	<b>2+2</b>
<b>Credit value – ECTS:</b>	<b>5</b>
<b>Time / location:</b>	<b>second semester</b>
<b>Lecturer:</b>	<b>Prof.Ass.Dr. Ylli Kortoci</b>
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<b>Course description</b>	
<b>Course description</b>	<p>Forest pedology describes land as natural resource and land utilization, but also preservation and land improvement. The lectures serve as didactic materials for forestry students and as a good reference for the specialists of this field. In the first part, these lectures talk about the main principles of soil formation, rocks, alteration, the origin of the earth, various concepts of climate influence, organisms, relives and time in the process of land formation, different processes of land formation as features of them, soil additions, losses, translocations and transformations. The composition of the soil including minerals, organic matter, surface water, groundwater, air of the soil, the ratio between soil materials. Soil profiles and horizons, genetic profile, specific horizon properties, vertical nodes. Physical properties of the soil. Color, soil texture, soil structure. Chemical properties of the soil, elements, essential nutrients, spare capacity, etc. This module focuses on physical, chemical, and biological processes that affect profile features of the soil as well as the nature and qualities of forest, pasture and agriculture lands. The module furnishes of advanced insights for soil as a component of natural ecosystems, the core processes of developing the profile land, lands of the main ecological regions of the world, the relationship between land and</p>

	<p>topography, interpretation of land characteristics as a basis for land evaluation, lands of forest ecosystems and pasture, degradation and rehabilitation of forests, soil parameters and soil quality, nutrients essential for plant growth, and fertilization of forests.</p>
<p><b>Course objectives:</b></p>	<p>This module focuses on physical, chemical and biological processes that affect the soil profile characteristics as well as the nature and qualities of forest, pasture and agriculture lands. The module provides advanced land-based knowledge as a component of natural ecosystems, basic land-soil development processes, landscapes of the major ecological regions of the world, soil and topography relationships, interpretation of land characteristics as a basis for land valuation, lands of forest and pasture ecosystems, degradation and rehabilitation of forest's soil parameters and soil quality, essential nutrients for plant growth, and forest fertilization. This module also provides knowledge on the methods and equipment used in the chemical-physical analysis of the soil, including the content of organic matter, cation exchange capacity, exchangeable bases and exchange acidity. The module also includes a field practice and a course project.</p> <p>The objective of this module is to increase the theoretical knowledge and practical skills of students in terms of studying, managing and preserving the land resources of the country with an emphasis on forest lands.</p> <p>At the end of the module, students are trained to:</p> <ul style="list-style-type: none"> <li>• Understand the soil and soil role in the structure and functioning of ecosystems.</li> <li>• Theoretically and conceptually understand the mechanism of pedological processes and their development through the description of the soil profile.</li> <li>• Assess the quality of soil based on measured soil parameters.</li> <li>• Understand spread, genesis, characteristics of forest and pasture lands.</li> <li>• Understand in-depth land-plant interactions, recycling mechanisms of nutrients in forest ecosystems, principles and practices of forest composting.</li> </ul>

<b>Learning outcomes:</b>	<p>Upon completion of this course students should be able to understand the notions:</p> <p>Pedosphere - Ecosystem - Soil characteristics - Soil quality - Pedological processes – Soil gains – Soil losses - Translocations / Transfers - Transformations - Calcification - Decalcification - Ferralitisation - Salification - Alkalizing - Dealkalisation - Spraying - Pedoturbation - Arctic Land - Temperate lands - Lands of the steppe - Dry and semi-dry land - Tropical and subtropical lands - Landscape - Katene - Toposekence - Forest lands - Forest litter - Carbon cycle - Nitrogen cycle - Soil organisms - Pasture land - Soil degradation - soil erosion - soil slides - soil compaction - fertilization of soil - soil interpretation - soil fertility - microbiological soil processes - macroscopic - micronutrient - plant nutrient functions - absorption of nutrients from plants - Nutrient resources in a forest ecosystems - Loss of nutrients in forest ecosystems - Chemical and organic fertilizers - Fertilizer application systems - Integrated plant food system - Land diagnostics - Field surveys - Plant tissue analysis - Land analysis.</p>
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**Contribution on student load (must correspond with learning outcomes)**

<b>Activity</b>	<b>Hours</b>	<b>Days/week</b>	<b>Total</b>
Lectures	2	15	30
Exercise theoretical/laboratory	2	15	30
Practice work			
Contact with lecturer/consultations	8/semester	-	8
Field exercises			
Mid-terms, seminars	2/semester	-	2
Homework	6/semester	-	6
Individual time spent studying (at the library or home)	4	15	70
Final preparation for the exam	6/semester	-	6
Time spent in evaluation (tests, quiz, final exam)	6/semester	-	6
Projects, presentations, etc.	7/semester	-	7
<b>Total</b>			<b>165 hours</b>

<b>Teaching methods</b>	Lectures, discussions, laboratory exercises, expeditions consultations, seminars, independent projects, homework assignments, colloquium,
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	course assignments, exams.
<b>Evaluation methods</b>	First assessment (colloquium): 15%, Seminars or other engagements: 10%, Regular attendance: 5% Final exam: 70%, Total: 100%.
<b>Literature</b>	
<b>Basic Literature:</b>	1) Gjoka, F. 2017. Ekopedologjia dhe Pleherimi I Pyjeve [Cikël leksionesh dhe slide prezantimi]. 2) Gjoka, F. 2017. Praktika Laboratorike të Pedologjisë
<b>Additional Literature:</b>	1) Gjoka, F. 2015. Pedogjeografia [Tekst], Tiranë [Prezente në Bibliotekën e UBT] 2) Duchaufour, P. 1982. Pedology: Pedogenesis and Classification. London: Allen and Unwin. [Prezente në Bibliotekën e UBT] 3) Brady N.C., and R.R. Eeil. 2002. The nature and properties of soils. 13th ed. Prentice Hall, Upper Saddle River, NJ. 881 pp. [Prezente në Bibliotekën e UBT].
<b>Designed study plan:</b>	
<b>Week</b>	<b>Lectures which will be held</b>
<b>First week:</b>	Soil as a component of natural ecosystems (Object of discipline, Role of soil in the structure and function of ecosystems, soil quality).
<b>Second week:</b>	Soil as a component of natural ecosystems (Object of discipline, Role of soil in the structure and function of ecosystems, soil quality).
<b>Third week:</b>	Pedological processes and land development (additions, losses, translocation and transformation, ferralitization, desalification, decalcification, salification, alkalization, dealkalization, gleizis, pedoturbation, etc. Differentiation of the soil's horizons).
<b>Fourth week:</b>	Pedological processes and land development (additions, losses, translocation and transformation, ferralitization, desalification, decalcification, salification, alkalization, dealkalization, gleizis, pedoturbation, etc. Differentiation of the soil's horizons).
<b>Fifth week:</b>	Soils of the main regions of the world (soils of the cold and temperate regions, soils of steppe regions, soil of dry and semi-dry regions, soils of savanna regions, soils of sub-tropical and tropical regions).
<b>Sixth week:</b>	Soils of the main regions of the world (soils of the cold and temperate regions, soils of steppe regions, soil of dry and semi-dry regions, soils of savanna regions, soils of sub-tropical and tropical regions).
<b>Seventh week:</b>	Interaction between land and topography.

<b><i>Eighth week:</i></b>	Interaction between land and topography.
<b><i>Ninth week:</i></b>	Soils of forest ecosystems (Forest land concept, Genesis and characteristics of forest lands, Land of forest nurseries).
<b><i>Tenth week:</i></b>	Soils of pasture ecosystems (The concept of pasture lands and meadows. Pasture land genomes. Pasture land characteristics).
<b><i>Eleventh week:</i></b>	Degradation of forest / pasture lands and rehabilitation (Land degradation factors, Types of soil degradation (physical, chemical and biological, degraded soil rehabilitation methods).
<b><i>Twelfth week:</i></b>	Land interpretation as a basis of land evaluation (pedological interpretation of soil properties, interpretation of land qualities in relation to land use).
<b><i>Thirteenth week:</i></b>	Soil fertility and plant nutrition (Concepts of soil fertility, Characteristics of fertile soil, Objectives related to soil fertility, Land characteristics associated with soil fertility).
<b><i>Fourteenth week:</i></b>	Essential nutrients for plant growth (Makronutrients and plant microorganisms, nutrient absorption from the soil, sources of nutrients in forest ecosystems, nutrient loss in forest ecosystems).
<b><i>Fifteenth week:</i></b>	Fertilizers and fertilization of forests and pastures (causes of the use of fertilizers in forests, fertilizers and organic fertilizers, fertilizer application systems, fertilizer types, integrated feed system of plants).

**Academic policies and rules of conduct:**

Regular and active participation of students in lectures, exercises (practical part) and in seminar work.

Keeping quiet in lecture, disabling mobile phones, timely access to the classroom, etc.

## Exercises

<b>Designed study plan:</b>	
<b>Week</b>	<b>Exercises which will be held</b>
<b><i>First week:</i></b>	Description of the soil profile (Demonstration of field description procedure, Practice in soil profile description and interpretation, course project guidance).
<b><i>Second week:</i></b>	Description of the soil profile (Demonstration of field description procedure, Practice in soil profile description and interpretation, course project guidance).
<b><i>Third week:</i></b>	Determination of organic substance (Demonstration of chromic acid oxidation method / loss in burning of organic

	earth carbon particle determination, practice in determining organic earth carbon assistance by laboratory technical staff. Calculation and interpretation of results).
<b>Fourth week:</b>	Determination of organic substance (Demonstration of chromic acid oxidation method / loss in burning of organic earth carbon particle determination, practice in determining organic earth carbon assistance by laboratory technical staff. Calculation and interpretation of results).
<b>Fifth week:</b>	Determination of cation exchange capacity (Demonstration of ammonium acetate (or hexaamminecobalt) method of cationic capacity determination. Practice in determining the cationic exchange capacity assisted by laboratory technical staff. Calculation and interpretation of results).
<b>Sixth week:</b>	Determination of cation exchange capacity (Demonstration of ammonium acetate (or hexaamminecobalt) method of cationic capacity determination. Practice in determining the cationic exchange capacity assisted by laboratory technical staff. Calculation and interpretation of results).
<b>Seventh week:</b>	Determination of bases.
<b>Eighth week:</b>	Seminar (1): Topics 1-7.
<b>Ninth week:</b>	Determination of interchangeable bases.
<b>Tenth week:</b>	Determination of acidity of the exchange (Demonstration of the KCl (or BaCl <sub>2</sub> 0.1M) method of exchange acidity determination. Practice in the determination of interchangeable acidity assisted by the technical staff of the laboratory. Calculation and interpretation of the results) (Practice of Pedology).
<b>Eleventh week:</b>	Determination of heavy metals (Demonstration of HNO <sub>3</sub> method of determination of heavy metals. Practice in determination of heavy metals assisted by laboratory technical staff. Calculation and interpretation of results) (Practice of Pedology).
<b>Twelfth week:</b>	Determination of the fertilizer dosage (Determination of the N fertilizer rate to be used in forest nurseries. Determination of the rate of fertilizer P to be used in forest nurseries) (Practice of Pedology).
<b>Thirteenth week:</b>	Determination of the lime and gypsum dose (Determination of the application of lime application in acidic soils, Determination of the application of gypsum in alkaline soil). (Practice of Pedology).
<b>Fourteenth week:</b>	Field practice (Demonstration of the field description procedure using WRB. Practice in describing and interpreting the lands of forest and pasture ecosystems) (Practice of Pedology).
<b>Fifteenth week:</b>	Seminar (2): Topics 8-12.

