



“FOREST ENGINEERING” SYLLABUS

Basic data of the subject	
Academic Unit:	Life and Environmental Sciences Faculty
Course title:	Forest engineering
Program:	Forest and environmental sciences
Level:	Bachelor
Course status:	Compulsory
Study year:	Second year, Fourth semester
Number of hours per week:	3+2
Credit value – ECTS:	6
Time / location:	To be announced
Lecturer:	Prof.Asoc.Dr. Ylli Kortoci
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Course description:	<p>Forest Engineering module deals with topics that help to prepare students as future technicians for sustainable forest management and the environment as a whole. Communication and traffic in forests. Types of public communication. Public communication and its role for forestry. Historical development, state and future of public communication. Historical development of traffic in forests and forest communication. Characteristics of traffic in forests. Traffic load and transport quantity. Graph of traffic load and transportability of forest communication. Types of traffic means and technical elements of forest communication. Longitudinal profile and factors of the longitudinal ingredient. Ideal and maximal longitudinal inclination. Course of longitudinal slope and equivalent ingredient. Shaping of longitudinal slope breaking points. Shaping and elements of vertical curves. Cross profiles of forest communication. Basic and special forms of cross profiles. Typical cross profile. Width factors of road lower layer. Traffic capacity of forest roads. Elements of forest road centre line. Cross inclination of forest road carriageway. Widening of forest road carriageway and open profile. Hairpin bends. Construction work for lower road layer. Construction of upper road layer. Carriageway and road formation drainage. Forest roads on unstable rock base. Maintenance of forest roads. Procedures of maintenance, organization of maintenance work. Ensuring forest road transportability and categorization of forest roads. Standards of maintenance. Forest roads on private forest property.</p>
Course objectives:	<p>The purpose of the "Forest Engineering" module is to familiarize students with the essentials of forest access, forest road construction and forest maintenance, artworks on forest roads, bridges, and their necessity in forestry.</p>



Learning outcomes:	<p>Through the program "Forest Engineering" students will receive the information needed in:</p> <ul style="list-style-type: none"> • Description of forest accessibility. • Classification of the forest network in a management unit. • Analyzing the impact of forest network on silvicultural applications. • Prediction of impact of forest network on forest utilization. • Management of road repairs and maintenance. 		
Contribution on student load (must correspond with learning outcomes)			
Activity	Hours	Days/week	Total
Lectures	3	13	39
Exercise theoretical/laboratory	2	9	18
Practice work	2	10	20
Contact with lecturer/consultations	1	15	15
Field exercises	2	3	6
Mid-terms, seminars	2	2	4
Homework	-	-	-
Individual time spent studying (at the library or home)	2	15	30
Final preparation for the exam	1	11	11
Time spent in evaluation (tests, quiz, final exam)	1	5	5
Projects, presentations, etc.	2	1	2
Total			150 hours (6 ECTS)
Teaching methods :	Lectures, discussions, laboratory exercises, expeditions, consultations, seminars, independent projects, course assignments, colloquium, exams.		
Evaluation methods:	<p>First evaluation (exam): 10%, Second evaluation (exam): 10% Seminars or other engagements: 10%, Regular active attendance: 15%, Final exam: 55%. Total 100%.</p>		
Literature			
Basic Literature:	<ul style="list-style-type: none"> • Kotro M. 2006. Mberritshmeriua e pyjeve. • Potocnik, I., 2003. Forest road formation ëidth as an indicator of human impact on forest environment. Ekologia (Brtisl.). 		

	<ul style="list-style-type: none"> • Potocnik,I., 1998. The environment in planning a forest road network. Forestry Sciences. Vol.54. Dordrecht; Boston, London: Kluwer Academic Publishers. • Mberritshmeria dhe Shfrytezimi i Pyjeve . Mihallaq Kotro. Panajot Koci. (2000). • FAO. Model Code of Forest Harvesting Practices (1996). • Giovanni Hipoliti “Le utilizzazioni Forestali” (1990). • KortoçI,Y.,Kellezi, M. (2012):Shfrytezimi i pyjeve te ahut te Shqiperise me nje silvikulture te gendrueshme.
Additional Literature:	<ul style="list-style-type: none"> • Luciano Martarello, Arturo Millesi, Renzo Rey, Nevio Yeullaz, Giancarlo Zorzetto Struttura forestazione e sentieristica - Regione Autonoma Valle d’Aosta (Quart). • Ruggero Marazzato, Tiziano Martin – Settore Gestione Proprietà Forestali Regionali e Vivaistiche – Regione Piemonte (Vercelli).

Designed study plan:		
Week	Lectures	Exercises
<i>First week:</i>	Forest accessibility, "forest engineering". Brief history of forest roads.	Practical field trip on work methodology for forest roads track selection.
<i>Second week:</i>	Road infrastructure and forest environment. The terrain of forest roads, the environment where they are built.	Forest roads, interventions in complex construction work.
<i>Third week:</i>	The effects of forest engineering on forestry works and its efficiency in achieving its goals.	Accessibility on ground roads, motorways, natural runways.
<i>Fourth week:</i>	Traffic load and transport quality. Graphing the forest load and its transport.	Artificial tractor roads, technological scheme of construction of these roads.
<i>Fifth week:</i>	Road network planning and density. What is and what should be the percentage of forest roads.	Intermediate exam. Forest service strategies, with auto routes, paving the way for firefighting intervention.
<i>Sixth week:</i>	Basic principles of road design. Office work, map and field road design.	Road and environmental infrastructure, impact of road on forest environment.



<i>Seventh week:</i>	Road network and forest environment. Runways, loading scaffolds, terrain slope, etc.	Multifunctional role of auto road in binomial forest - road network.
<i>Eighth week:</i>	Design norms of forest roads. Daily rates, tender works, control procedures etc.	Peculiarities of forest roads, their classification by distance from rural centers.
<i>Ninth week:</i>	Construction of forest roads. Gross road type works, work volume, necessary tools.	Practical field trip on factors and elements influencing the extension of the forest road network.
<i>Tenth week:</i>	Bioengineering works. Ensure the durability of the road body.	Practical basics of determining the rate of forest service by auto road.
<i>Eleventh week:</i>	Road platform construction. Canal construction, longitudinal, sloping, drainage.	Intermediate exam. Practices of arrival and density, in auto roads extension.
<i>Twelfth week:</i>	Elements of the central forest road line, works of art. Bridges, side walls, barriers etc.	Basic principles of forest road design, office work, fieldwork (course project).
<i>Thirteenth week:</i>	Providing transport through forest roads and categorizing forest roads.	Classification and dimensions of forest roads, management codes for road construction (course project).
<i>Fourteenth week:</i>	Systems for accessing and extracting timber from forests. Collection roads and runways.	Applicable examples of internal roads of timber approach by tractor.
<i>Fifteenth week:</i>	Maintenance standards. Maintenance of forest roads.	Tools and mechanisms for road works. Bulldozer, scraper, greider etc.
Academic policies and rules of conduct:		
Regular and active participation of students in lectures, exercises (practical part) and in seminar work. Keeping quiet in lessons, disabling mobile phones, timely access to the classroom, etc.		