



SVEUČILIŠTE U ZAGREBU FAKULTET ŠUMARSTVA I DRVNE TEHNOLOGIJE
UNIVERSITY OF ZAGREB FACULTY OF FORESTRY AND WOOD TECHNOLOGY

**Graduate study Forestry; Programme: Techniques, Technology and
Management in Forestry**

Assessment methods and criteria

Acad. Year 2024/25



List of learning outcomes for the Graduate study Forestry, Study Techniques, Technologies and Management in Forestry

A) general engineering competence

- A1: independently gather data, statistically process, present and analyse data, discuss and conclude based on analysed data and distinguish possibilities of different interpretation of the same problem analysed in different ways
- A2: explain position and trends of forestry profession in the country and worldwide
- A3: apply simpler methods of operation research

B) focused engineering competence

- B1: organise and perform tasks of greater complexity in forestry, from forest office and forest management unit as the lowest forestry structural units along the vertical
- B2: implement forest management programs
- B3: manage and make independent professional (business) decisions from the field of timber harvesting, forest opening, designing of forest road network and forestry entrepreneurship
- B4: organise and perform forest planning works
- B5: manage protection of forests from abiotic and biotic factors, and organise procedures in protection of forests
- B6: recommend and choose forest machines, techniques and standard technologies used in forestry above all in timber harvesting from natural forests, even-aged and unevenaged stands, culture, plantation, and energy forests
- B7: select and choose mechanical means based on cost analysis and other criteria
- B8: measure and evaluate quality parameters of timber assortments and interpret their size and meaning
- B9: apply scientific insights on wood as renewable material and optimise usage of wood by applying harvesting technologies of forest residual
- B10: apply knowledge related to forest main and secondary forest products and their shipment from the place of production to the market via forest soil, skid trails and the network of forest and public roads
- B11: apply knowledge related to marketing of forest main and secondary forest products
- B12: apply knowledge related to the methods for preparing and planning technical works in forestry
- B13: manage forest, human resource, and technical potential during performance of forest works
- B14: apply knowledge related to the methods, techniques, and technology of opening of forests, i.e. designing and constructing a network of forest roads
- B15: design a network of forest roads
- B16: develop current technologies as well as implement new technologies

C) organizational engineering competence

- C1: plan, organise and works of organization of production in forestry
- C2: organise and conduct sale of timber assortments and timber products on domestic and worldwide market
- C3: organise and manage work safety in forestry
- C4: plan and calculate production, calculate basic indicators of successful business, compose basic financial reports, recognise and analyse types of costs
- C5: manage the most complex tasks in all forms of forest organizations, forest and hunting advisory service; forest entrepreneurship



- C6: manage tasks of county and national institutions competent for forestry; inspection services
- D) developing engineering competence
- D1: conduct businesses of scientific and professional associate in scientific-research institutions in the field of forestry
- D2: conduct courses in professional secondary and other similar schools
- D3: conduct businesses and tasks in publicist writing and media connected with forestry
- D4: professionally and scientifically upgrade through different educational ways and postgraduate study
- D5: gather, process and interpret reference sources and prepare simpler written professional or scientific paper



The connection between the learning outcomes of the course and the learning outcomes of the program

Courses' code	General engineering competence			Focused engineering competence																Organizational engineering competence						Developing engineering competence				
	A1	A2	A3	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	B14	B15	B16	C1	C2	C3	C4	C5	C6	D1	D2	D3	D4	D5
225889			+	+		+			+	+					+	+							+							+
225890									+			+																		
33902	+																							+		+				
33903	+	+																										+		
33911	+														+				+										+	
33943								+								+			+											
33945				+							+										+									
33946	+	+																				+								
225898																+				+				+						
225899				+												+				+				+					+	
33904						+									+	+	+													
33905	+										+		+								+									
33906					+			+							+				+											
33907					+			+																						
225891	+				+		+													+					+	+	+		+	
33949				+							+										+									
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33951										+							+													
225900									+										+											
225901	+		+																					+			+	+		
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225893									+													+								
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33955				+		+			+	+					+					+										
33956																+				+				+						
225902															+	+	+													
225895		+							+								+													
225913	+				+											+				+										+
225897	+																													+



Timber Harvesting Systems

Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
Present the laws of timber harvesting efficiency (influential factors, ways of carrying out works in forestry, mechanization laws in timber harvesting, interaction with stand and exploitation factors, performance and labor productivity, standardization and labor costs, methods of direct cost calculation).	Exercises, Partial exam, Final Exam	A3, B1, B3, B6, B7, C4
Interpret the development of techniques and technologies in timber harvesting (development of equipment and methods of work, discontinuous evolution theory, system optimization)	Exercises, Partial exam, Final Exam	B6, B7, D5
Present timber harvesting system (system elements and timber harvesting subsystems, component interaction, and visualization of the system).	Exercises, Partial exam, Final Exam	B12, B13
Valorize partially mechanized timber harvesting systems (buck-to-quality, tree-length, half-tree-length method, firewood production).	Exercises, Partial exam, Final Exam	B12, B13, C4
Present mechanized timber harvesting systems (cut-to-length and full tree method, centralized timber yards and roundwood processing)	Exercises, Partial exam, Final Exam	B12, B13



Methods of grading

Evaluation elements	Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students' workload outside the direct teaching	ECTS
Lectures (L)	-	-	-	30		1
Field work				8		0.25
Exercises (E)	10%	Partly disordered and incomprehensible, with major corrections and on time	Sufficient (2)	30	20	1.75
		Neat, with bigger corrections and on time	Good (3)			
		Neat, with minor corrections and on time	Very good (4)			
		Neat, accurate and timely	Excellent (5)			
Partial exam I (PE I) (Influential factors and laws of timber harvesting efficiency)	30%	60-70%	Sufficient (2)		25	1
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
Partial exam II (PE II) (Timber harvesting systems optimization)	60%	60-70%	Sufficient (2)		55	2
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
TOTAL	100%	(Ex10+PEIx30+PEIIx60)/100 or (Ex10+WEx30+OEx60)/100		68	100	6



Evaluation elements	Maximum points or Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students' workload outside the direct teaching	ECTS credits
Written exam (WE)	30%	60-70% 71-80% 81-90% 91-100%	Sufficient (2) Good (3) Very good (4) Excellent (5)		25	1
Oral exam (OE)	60%	60-70% 71-80% 81-90% 91-100%	Sufficient (2) Good (3) Very good (4) Excellent (5)		45	1.5
TOTAL	100%	(Ex10+PEI1x30+PEIIx60)/100 or (Ex10+WEx30+OEx60)/100				

Evaluation elements	Maximum points or Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students' workload outside the direct teaching	ECTS credits
Final exam (FE)	75%	60-70% 71-80% 81-90% 91-100%	Sufficient (2) Good (3) Very good (4) Excellent (5)			2.5
TOTAL	100%	(FEx75+Ex10+PEx15)/100				

*The final exam consists of the written and oral exams. Students take the final exam if they did not pass both partial exams.



Detailed description of evaluation elements for lectures, exercises, partial or final exams:

Evaluation elements	Description	Deadline	Compensation
Lectures and exercises	The attendance is checked and the attendance of the students is recorded. The student can justifiably absent from a maximum of 20% of the lectures and 10% of the exercises.	semester (60 hours of direct teaching)	-
Field work	The attendance is checked and the attendance, and the activity of the students is recorded.	semester (8 hours of direct teaching)	
Exercises preparation	Exercises are attended in groups. At the beginning of the first exercise, students will get task templates. The accuracy and regularity are evaluated.	in accordance with the agreed terms	Exceptionally, in the case of a justified reason, the student can compensate the absence of the individual exercise
Partial exam I	The achievement of learning outcomes 1 and 2 is checked.	6 th week	
Partial exam II	The achievement of learning outcomes 3, 4 and 5 is checked.	15 th week	-
Written exam	The exam can be attended by students who have completed exercises but did not pass the exam through the colloquium. Students solve the calculation task and answer the questions. The written exam is graded and participates in the final grade of the course.	Exam terms	-
Oral exam	Students who pass a written exam are asked questions from different parts of the program content. The final grade is calculated according to formula: $(Ex10+WEx30+OEx60)/100$	Exam terms	



Mechanization of Timber Logging

Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
Compare machines for tree felling and processing – motor chainsaws (history development, parts and elements, chainsaw use in Croatia, energy and environmental suitability of 2-stroke engines, chain (construction and maintenance), ergonomic features, guidelines of development, morphological analysis of chainsaw).	Exercises, Partial exam, Final exam	B6
Recommend machines for tree felling and processing – Harvesters (basic technical features, types, morphological, ergonomic, energy and environmental characteristics of harvester).	Exercises, Partial exam, Final exam	B6
Recommend forest vehicles for timber logging – Skidders, Forwarders (construction, types of skidders and forwarders, technical features, principle of Diesel engine, environmental suitability, morphological features).	Exercises, Partial exam, Final exam	B6
Present machines for timber transport – tractor assemblies (adapted farming tractor, adaptation for forest work, farming tractor equipped with forest winch, tractor with semi-trailer and crane).	Exercises, Partial exam, Final exam	B6
Present other machines of mechanised timber logging (forest trucks for timber transport, forest cableways, forest biomass chippers).	Exercises, Partial exam, Final exam	B9



Methods of grading

Evaluation elements	Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students' workload outside the direct teaching	ECTS
Lectures (L)	-	-	-	30		1
Field work				16		0.5
Exercises (E) and writing of reports from filed work	20%	60-70%	Sufficient (2)	15	30	1.5
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
Partial exam I (PE I)	30%	60-70%	Sufficient (2)		30	1
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
Partial exam II (PE II)	50%	60-70%	Sufficient (2)		30	1
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
TOTAL	100%	(Ex20+FE_x80)/100		61	111	5



Evaluation elements	Maximum points or Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students' workload outside the direct teaching	ECTS credits
Written exam (WE)	30%	60-70%	Sufficient (2)		25	1
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
Oral exam (OE)	50%	60-70%	Sufficient (2)		45	1
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
TOTAL	100%	$(Ex10+PEIx30+PEIEx60)/100$ or $(Ex10+WEx30+OEx60)/100$				2

Evaluation elements	Maximum points or Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students' workload outside the direct teaching	ECTS credits
Final exam (FE)		60-70%	Sufficient (2)			2
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
TOTAL	100%	$(FEx80+Ex20)/100$				

*The final exam consists of the written and oral exams. Students take the final exam if they did not pass both partial exams.



Detailed description of evaluation elements for lectures, exercises, partial or final exams:

Evaluation elements	Description	Deadline	Compensation
Attendance of lectures, exercises and field work	The attendance is checked and the attendance of the students is recorded. Filed work and measuring exercises are obligatory. A student may justifiably be absent with a maximum of 20% of other types of direct teaching hours (lecturers and calculation exercises).	semester (61 hours of direct lecturer)	-
Exercises preparation	Exercises are attended by groups. 4 measuring tasks are performed within the exercise. Students become acquainted with measurement methods, independently perform measurements and process data. At the beginning of the first exercise, students will receive templates with exercise assignments, as well as the appearance of the collage, jumper, and list of suggestions in which they will respond to the set tasks in printed form. The accuracy, regularity and regularity (time-honored exercises) are evaluated.	in accordance with the agreed terms	
Partial exam I	The achievement of learning outcomes 1 and 2 is checked..	8 th week	
Partial exam II	The achievement of learning outcomes 3, and 4 is checked.	15 th week	-
Written exam	Examinations can be attended by students who have completed exercises and field teaching. Students on printed exams receive tasks and make calculation on a separate paper. The written exam is evaluated and participates in the final grade of the subject.	Exam terms	-
Oral exam	Students who pass a written exam are asked questions from different parts of the program content. The final grade is calculated according to formula: $(Ex20+FE\bar{x}80)/100$	Exam terms	



Management and Entrepreneurship in Forestry

Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
Interpret a concept, features and basic functions of modern management and explain functioning of the team in project management.	seminar, practice exercises, partial exam, knowledge test, final exam	A1, C5, D1
Explain the roles of individual actors and project phases in project management and illustrate project life cycle.	seminar, practice exercises, partial exam, knowledge test, final exam	A1, C5, D1
Apply group decision-making techniques to finding ways to achieve project goals.	seminar, practice exercises, partial exam, knowledge test, final exam	A1, C5, D1
Carry out team assessors and create models of financial and non-financial motivation.	seminar, practice exercises, partial exam, knowledge test, final exam	A1, C5, D1
Carry out an analysis of the entrepreneurial climate and see the favorable entrepreneurial opportunities in the forestry sector	seminar, practice exercises, partial exam, knowledge test, final exam	A1, C5, D1
Select an appropriate entrepreneurial strategy and create a list of indicators for evaluation of a specific entrepreneurial venture.	seminar, practice exercises, partial exam, knowledge test, final exam	A1, C5, D1
Describe elements for overall (economic, environmental and social) assessment of the project	seminar, practice exercises, partial exam, knowledge test, final exam	A1, C5, D1
Analyse elements of business strategy for strengthening competitiveness of forestry sector and identify the areas of possible submission in entrepreneurial projects in framework of EU operational programs.	seminar, practice exercises, partial exam, knowledge test, final exam	A1, C5, D1



Methods of grading

Evaluation elements	Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students' workload outside the direct teaching	ECTS
Lectures (L)	-	-	-	30	0	1
Exercises (E)	-	-	-	30	30	2
Field work (FW)	-			16		0,5
Making of seminar paper (SP)	10%	-	-		7	0,25
Partial exam I. (PE) (Project management in forestry)	30%	60-70%	Sufficient (2)	-	25	0,75
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
Partial exam II. (PE) (Entrepreneurship in forestry)	60%	60-70%	Sufficient (2)	-	45	1,5
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
TOTAL	100%	(SPx10+PE1x30+PE2x60)/100		76	107	6

Evaluation elements	Maximum points or Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students' workload outside the direct teaching	ECTS credits
Final exam (FE)	30%	60-70%	Sufficient (2)		25	0,75
		71-80%	Good (3)			



Final exam (OE)	60%	81-90%	Very good (4)	45	1,5
		91-100%	Excellent (5)		
		60-70%	Sufficient (2)		
		71-80%	Good (3)		
		81-90%	Very good (4)		
		91-100%	Excellent (5)		
TOTAL	100%	(FEx30+OEx60)/100		76	2,25

Detailed description of evaluation elements for lectures, exercises, partial or final exams:

Evaluation elements	Description	Deadline	Compensation
Attendance of lectures and exercises	The attendance is checked, and the attendance of students is recorded. A student may justifiably be absent with a maximum of 15% direct teaching hours.	semester (60 hours of direct lecturer)	-
Making exercise	14 practical exercises are performed within the exercise. Before starting each individual exercise, students will receive materials related to exercise issues and task templates. Accuracy, neatness and regularity is evaluated (exercise submitted on time).	15. week	Exceptionally, in the case of a justified reason, the student makes up the absence from a particular exercise
Field work	Within the field course (2 days) is visited an entrepreneurial company oriented to expert services in forestry. Get acquainted with organization, business, and transformation and adaptation of the company to operate on the domestic and EU markets. The second course of field teaching is organized through meeting with successful managers and entrepreneurs in forestry, with the emphasis on developing business careers by acquiring the skills and competencies that are crucial for success in entrepreneurship and managerial work. The level of participation and contribution to the discussion	according to the field work plan	Exceptionally, in the case of a justified reason, the student is allowed to do the field teaching later



	regarding the teaching is evaluated.		
Seminar paper	Students prepare and present their seminar paper related to the relevant issue.		
Partial exam I	The achievement of the 1 st , 2 nd , 3 rd and 4 th learning outcomes is checked.	6 th week	
Partial exam II	The achievement of the 5 th , 6 th , 7 th and 8 th learning outcomes is checked.	15 th week	
Written exam	Students who have completed all the exercises and passed the colloquium can take the exam. Students answer the questions on a pre-made printed exam and circle the correct ones among the suggested answers. The written exam is graded and participates in the final grade of the course.	Exam terms	
Oral exam	Students who pass a written exam are asked questions from different parts of the program content. The final grade of the subject is obtained according to the formula (SPx10+FEEx30+OEx60)/100 or (SPx10+PEIx30+PEIEx60)/100		



Forestry Politics and Legislation

Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
Analyse global programs and forest policy documents (Forest Principles, Ministerial Conferences on European Forest Protection, Convention of Biological and Landscape Diversity, UN Framework Convention on Climate Change and the Kyoto Protocol, Europe 2020 Strategy, EU Forestry Strategy, Natura 2000 Ecological Network CR).	Knowledge test, final exam	A1, A2, D3
Present National Forestry Policy and Strategy: importance, strategic areas, goals and priorities, implementation concept - carriers, timelines, financing (National forestry program goals and tasks, Forestry Policies in Republic of Croatia in the light of National environmental protection program (NEAP), Biodiversity (NSAP), Forestry Measures, Forestry Certification).	Knowledge test, final exam	A1, A2, D3
Define organization of forestry administration in Republic of Croatia - Ministry, regional offices, inspection services (key actors in the forest sector, Forest Law in the Republic of Croatia, EU Guidelines and National subordinate regulations).	Partial test, knowledge test, final exam	A1, A2, D3
Analyse forestry policy in Republic of Croatia with view on EU context (Europe 2020 as a Strategic Framework for Equitable EU Development, EU Cohesion Policy, Programming Principle, Rural Development Program of Croatia, Principles and Criteria for project applications and allocation of funds by measures).	Knowledge test, final exam	A1, A2, D3



Methods of grading

Evaluation elements	Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students' workload outside the direct teaching	ECTS
Lectures (L)				30	0	2
Partial exam from Legislation (K)	15%	60-70%	Sufficient (2)	1	30	0.5
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
Exam (E)	85%	60-70%	Sufficient (2)		50	1.5
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
TOTAL	100%	(Kx15+Ex85)/100		31	80	4

Evaluation elements	Maximum points or Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students' workload outside the direct teaching	ECTS credits
Final exam (FE)		60-70%	Sufficient (2)			2
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
TOTAL	100%	(Kx15+FEEx85)/100				



Detailed description of evaluation elements for lectures, exercises, partial or final exams:

Evaluation elements	Description	Deadline	Compensation
Attendance of lectures	The attendance is checked, and the attendance of the students is recorded. A student may justifiably be absent with a maximum of 15% of direct teaching hours.	semester (30 hours of direct lecturer)	-
Partial exam	Students in the pre-printed exam answer questions answered, round off accurate answers and supplement the words within the sentence. The partial exam is evaluated and participates in the final grade of the subject.	10. week	Students who pass the exam can access the exam
Written exam	Examinations can be attended by students who attended the lectures and passed the partial exam. The students in the pre-printed exam fit the questions asked, completing the correct answers. The written exam is evaluated and participates in the final grade of the subject.	Exam terms	-
Oral exam	Students who pass a written exam are questioned from different parts of program content by a lecturer. Final grade of subject is obtained according to the formula: $(K \times 15 + F \times 85) / 100$		



Digital Cartography in Forestry

Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
Pronounce the definition of digital cartography. Describe the goals and tasks of digital cartography. Distinguish cartographic signs. Describe equipment and software support for digital cartography needs. Specify the advantages and disadvantages of digital cartography.	comprehensive exam	D4
Explain the classification and types of maps. List the basic elements and characteristics of the map. Compare the topographic and thematic map. Comment on the purpose of cartographic generalization. Identify the factors on which depends degree of generalization.	comprehensive exam	D4
Categorize types and forms of data. Analyze the types of spatial data for the valorization of space. Describe and interpret spatial data models.	comprehensive exam	D4
Explain the term of vector and raster digitalization. Present the transformation process/procedure of the coordinates. Compare and analyze vector and raster digitalization. Explain and show the georeferencing and orthorectifying procedure. Create different thematic maps.	Performing exercises in a computer classroom, midterm exam, comprehensive exam	A1, B12, B16, D4
Pronounce the definition of a digital relief model. Describe and explain the ways of creating and editing of DRM data. Present the creation of the DRM. Show the methods of visualizing DRM. Interpret the data obtained from DRM.	Performing exercises in a computer classroom, midterm exam, comprehensive exam	A1, B12, B16, D4
Link the use of remote research in digital cartography. Carry out the upgrading and improvement of cartographic displays for remote sensing products. Combine a topographic, thematic map with a created digital relief model and a digital orthophoto. Present a database editing and performing various searching with a purpose to obtain a new digital cartographic layer.	Performing exercises in a computer classroom, midterm exam, comprehensive exam	A1, B12, B16, D4



Methods of grading

Evaluation elements	Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students' workload outside the direct teaching	ECTS
Lectures (L)	-	-	-	30	0	1
Exercises (E)		-	-	15	7.5	0.75
Partial exam (PE)	25%	60-70%	Sufficient (2)		7.5	0.25
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
Comprehensive exam (CE)	75%	60-70%	Sufficient (2)		30	1
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
TOTAL	100%	(PE_x25+CE_x75)/100		45	45	3



Detailed description of evaluation elements for lectures, exercises, partial or final exams:

Evaluation elements	Description	Deadline	Compensation
Lectures	On the teaching is checked and recorded the presence of students. The student can justifiably absent from the highest 20% of hours of direct teaching (3 lectures).	semester (30 hours of direct lecturer)	-
Exercises	Exercises are held in a computer classroom. Each student is doing individual tasks. The accuracy, precision, regularity, and engagement on the exercises are evaluated. 2 absences from exercises are allowed with the additional preparation of the seminar work.	In accordance with the syllabus and agreed terms directly with the students.	The student work off for absence from the individual exercise term
Midterm exam	A compulsory midterm exam is laid within the course. The term is agreed with the students. The midterm exam can be accessed by students who have reviewed and accurate individual tasks. A passed midterm exam is a condition for students to get a signature and to go to the oral exam. The midterm exam is repeated during the academic year, according to the published schedule of exams.	Eight days before each test deadline, according to the published schedule.	-
Regular examination deadlines	All students who have fulfilled their obligations in relation to lectures and exercises and passed the midterm exam are eligible to attend a regular exam period. On exam checks knowledge of the entire program (implemented through theoretical lectures and exercises). A passed midterm examination is a requirement for an oral exam, and grade of a midterm examination is part of the final grade.	Published examination deadlines.	-



Torrent Management

Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
Apply to hydro engineering (water management areas and branches and water management systems and solutions, hydrology components, hydrometrics, hydraulics, hydrometeorology and basin characteristics - size, shape, decline, altitude relationships, river basin processes etc.).	Colloquium, Seminar, Final exam	B13
Analyse soil erosion (elements of erosion, factors affecting erosion formation and complex deformation of terrain due to erosion).	Colloquium, Seminar, Final exam	B5
Present the streams (general characteristics of torrential and torrential regulation, buoy flow classification, buoyancy determination, geomorphologic calming downs, equations and projected torrents, principles and systems for river basin regulation planning, and active and passive flood planning).	Colloquium, Seminar, Final exam	B16



Methods of grading

Evaluation elements	Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students workload outside the direct teaching	ECTS
Lectures (L)	-	-	-	15		0.5
Seminar (S)	10%				5	0.1
Colloquium I. (C)	45%	60-70%	Sufficient (2)		22.5	0.7
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
Colloquium I. (C)	45%	60-70%	Sufficient (2)		22.5	0.7
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
TOTAL	100%	(2Cx90+Sx10)/100		15	50	2

Evaluation elements	Maximum points or Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students' workload outside the direct teaching	ECTS credits
Final exam (FE)	90 %	60-70% 71-80% 81-90% 91-100%	Sufficient (2) Good (3) Very good (4) Excellent (5)			1.4
TOTAL	90%	(FE_x90+S_x10)/100				



Detailed description of evaluation elements for lectures, exercises, partial or final exams:

Evaluation elements	Description	Deadline	Compensation
Attendance of lectures	The attendance is checked and the attendance of the students is recorded. A student may justifiably be absent with a maximum of 20% of direct teaching hours.	semester (15 hours of direct lecturer)	-
Seminar (S)	Students prepare and present their seminar paper related to the relevant issue	semester	
Colloquium I.	Kolokviji se ocjenjuju i sudjeluju u konačnoj ocjeni na predmetu.	8 th week	
Colloquium II.	The colloquiums are evaluated and participate in the final grade of the course. Only students who have passed the first colloquium can participate in the second colloquium.	15 th week	
Final exam (FE)	Students who did not pass the subject through the colloquium take the written exam. Students answer the questions on a pre-made printed exam. The written exam is graded and constitutes the final grade of the course. The final grade in the course is obtained according to the formula (FEx90+Sx10)/100	Exam terms	-



Physical and Mechanical Properties of Wood

Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
Determination and evaluation of macroscopic characteristics of wood in application of conditional characteristics of trees.	Written and oral exam	B1, B8, C2
Determination and evaluation of physical properties of wood in the application of conditional characteristics of trees.	Written and oral exam	B1, B8, C2
Determination and evaluation of mechanical properties of wood in application of conditional characteristics of trees.	Written and oral exam	B1, B8, C2
Determination and valuation of wood defects in application of conditional characteristics of trees.	Written and oral exam	B1, B8, C2
Evaluation and comparative analysis of macroscopic characteristics, physical and mechanical properties of timber derived from certain stands on the usability of wood for the manufacture of wood products.	Written and oral exam	B1, B8, C2

Methods of grading

Evaluation elements	Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students' workload outside the direct teaching	ECTS
Lectures (L)	-	-	-	15		0.5
Exam (E)	100%	60-70%	Sufficient (2)		45	1.5
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
TOTAL	100%	(Ex100)/100		15	45	2



Evaluation elements	Maximum points or Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students workload outside the direct teaching	ECTS credits
Final exam (FE)	100 %	61-70% 71-80% 81-90% 91-100%	Sufficient (2) Good (3) Very good (4) Excellent (5)			1.5
TOTAL	100%	(FEx100)/100				

Detailed description of evaluation elements for lectures, exercises, partial or final exams:

Evaluation elements	Description	Deadline	Compensation
Attendance of lectures and exercises	Students attendance is checked and notified. Student can miss 15% of the classes justifiably the most.	semester (15 hours of direct lectures)	-
Written and oral exam	The grade given on oral exam is final and it makes 100% of the grade.	In given exam periods	



Work Humanization in Forestry

Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
Analyze a work humanization in forestry (aim and area of humanization in forestry, workplace design procedures, forest safety guides, examples of good practice, work ability index and psychological loads in forestry practice).	knowledge test, final exam	A1, A2, C3
Present work environment, ergonomic design, PPE certification (working environment conditions for forestry; allowed, warning and harmful values; risk assessment and risk reduction measures; ergonomic design and cognitive ergonomics; basic health and safety requirements of the PPE and certification process).	knowledge test, final exam	A1, A2, C3
Define EU certification processes in the field of forestry work (development of training standards and training content for safe and humane work in forestry with the idea of establishing a center for forestry work in Croatia; humanization and safety of nonprofessional work).	knowledge test, final exam	A1, A2, C3

Methods of grading

Evaluation elements	Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students' workload outside the direct teaching	ECTS
Lectures (L)	-	-	-	15	0	0.5
Exam (E)	100%	60-70%	Sufficient (2)	0	45	1.5
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
TOTAL	100%	(Ex100)/100		15	45	2



Evaluation elements	Maximum points or Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students' workload outside the direct teaching	ECTS credits
Final exam (FE)	100 %	60-70% 71-80% 81-90% 91-100%	Sufficient (2) Good (3) Very good (4) Excellent (5)		45	1.5
TOTAL	100%	(FEx100)/100				

Detailed description of evaluation elements for lectures, exercises, partial or final exams:

Evaluation elements	Description	Deadline	Compensation
Attendance of lectures	The attendance of the students is checked and recorded. A student may justifiably be absent with a maximum of 15% of direct teaching hours.	semester (15 hours of direct lecturer)	-
Written exam	Exams can be attended by students who have fulfilled the requirement of attending lectures. Students on the previously designed printed exam answer questions, rounds out the correct answers, supplement the key terms within sentences. The written exam is evaluated and participates in the final grade of the subject.	Exam terms	
Oral exam	Students who pass a written exam are questioned from different parts of the program content by a lecturer. The final grade of the subject is obtained according to the formula FEx100/100		



Corporate Culture

Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
Formulate organizational culture in the context of environment and conditions in forestry (elements and functions of organizational culture, organizational climate and culture, classification and typology, design and maintenance of organizational culture, role and importance in forestry, influence of environment and ICT on organizational culture of enterprise, ethical components and contemporary trends in organizational culture, research and features of organizational culture in forestry).	Seminar, Written exam	C1
Present the measurement and management of organizational culture (methods and models of research, influence of managers on organizational culture, most known theories and models of leadership, subculture and change of organizational culture in the company).	Seminar, Written exam	B13
Evaluate organizational culture and organization effectiveness (impact of organizational culture on the success and efficiency of business systems, relationship between organizational culture and business strategy, examples of good practice, ie organizational culture of successful domestic and foreign companies).	Seminar, Written exam	C5



Methods of grading

Evaluation elements	Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students' workload outside the direct teaching	ECTS
Lectures (L)				15		0.5
Seminar (S)	20%	-	-		15	0.5
Exam (WE)	100%	60-70%	Sufficient (2)		30	1
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
TOTAL	100%	(Sx20+WEx80)/100		15	45	2

Evaluation elements	Maximum points or Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students' workload outside the direct teaching	ECTS credits
Final exam (FE)		60-70%	Sufficient (2)			1
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
TOTAL	100%	(Sx20+FEEx80)/100				



Detailed description of evaluation elements for lectures, exercises, partial or final exams:

Evaluation elements	Description	Deadline	Compensation
Attendance of lectures	Student attendance is checked and recorded. The student can justifiably be absent with a maximum of 20% of direct teaching hours.	semester (15 hours of direct lecturer)	-
Seminar	Students write and present their seminar work related to the given topic/problem	semester	
Written exam	The students in the prepared printed exam answer the questions asked and solve the problem tasks. The exam can be taken only by students who have prepared their seminar work. The written exam is evaluated and makes the final grade of the subject.	Exam terms	



Organizational Behaviour in Forestry

Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
Predict and explain individual, group, and overall behavior within organizations.	Seminar, Written exam	B1, B13, C1, C5
Design jobs that motivate, resolve conflicts, and motivate employees.	Seminar, Written exam	B1, B13, C1, C5
Organize and lead work teams and team tasks.	Seminar, Written exam	B1, B13, C1, C5, D4
Assess the impact of individuals, groups, and structures on behavior within organizations and apply that knowledge to improve organizational performance.	Seminar, Written exam	B13, C1, C5, D4

Methods of grading

Evaluation elements	Maximum points or Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students' workload outside the direct teaching	ECTS credits
Lectures (L)	-	-	-	15		0.5
Seminar (S)	20%	-	-		15	0.5
Exam (WE)	80%	60-70%	Sufficient (2)		30	1
		71-80%	Good (3)			
		81-90%	Very good(4)			
		91-100%	Excellent (5)			
TOTAL	100%	(Sx20+WEx80)/100		15	45	2



Evaluation elements	Maximum points or Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students' workload outside the direct teaching	ECTS credits
Final exam* (FE)		60-70% 71-80% 81-90% 91-100%	Sufficient (2) Good (3) Very good(4) Excellent (5)			1
TOTAL	100%	(Sx20+FEx80)/100				

Detailed description of evaluation elements for lectures, exercises, partial or final exams:

Evaluation elements	Description	Deadline	Compensation
Attendance of lectures	Student attendance is checked and recorded. The student can justifiably be absent with a maximum of 20% of direct teaching hours.	semester (15 hours of direct lecturer)	-
Seminar	Students write and present their seminar work related to the given topic/problem	semester	
Written exam	The students in the prepared printed exam answer the questions asked and solve the problem tasks. The exam can be taken only by students who have prepared their seminar work. The written exam is evaluated and makes the final grade of the subject.	Exam terms	-



Forest Accessibility

Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
Analyze strategic and tactical planning of forest roads (types of plans and planning – strategic, tactical and operational planning, strategic and tactical planning of forest roads, study of primary forest accessibility (level of management unit), study of secondary forest accessibility (level of a group of departments), upgrading and optimization of primary and secondary forest road infrastructure).	Practical exercises in specialized classroom, midterm exams, knowledge test, final exam	B12
Present the mean timber extraction distance and forest area accessibility (central and parallel extraction, values of correction factors of specific relief areas, actual and target mean timber extraction distance, advantages and deficiencies of the parameter mean timber extraction distance, primary and secondary forest accessibility, efficiency coefficient, advantages and deficiencies of the parameter forest accessibility, optimal forest accessibility and models of its calculation).	Practical exercises in specialized classroom, midterm exams, knowledge test, final exam	B3
Assess forest road density, as well as primary and secondary forest accessibility of different relief areas (register of primary and secondary forest road infrastructure, criteria for estimating optimal primary forest road infrastructure, economic, technical-technological, environment (ecological-aesthetic) criteria of optimization, primary and secondary forest accessibility for timber harvesting by skidding (lowland forests, hilly and mountainous forests), primary and secondary forest accessibility on sloped terrain for timber forwarding).	Practical exercises in specialized classroom, midterm exams, knowledge test, final exam	B14
Present the classification of the actual network of primary forest roads, criteria for estimating the optimum conditions (methodology study of primary forest accessibility, determination of the actual geometric (Euclidian) distance of timber extraction, criteria for estimating the	Practical exercises in specialized classroom, midterm exams, knowledge test, final exam	B14



optimum conditions and classification into priority levels).	
Define the optimization of the primary forest road network - horizontal and vertical (analysis of selected possible routes of future forest roads and achieving the target primary classical accessibility, optimization of newly planned routes of forest roads in view of vertical development of individual forest road routes, development of the register of upgraded network of primary forest traffic infrastructure, analysis of quantity and quality of upgraded network of primary forest traffic infrastructure).	Practical exercises in specialized classroom, midterm exams, knowledge test, final exam B14
Present methodological study of secondary forest accessibility (design and establishment of GIS on such area, analysis of the actual work on secondary forest traffic infrastructure, selection of possible routes and analysis of future secondary forest roads, optimization of newly planned network of secondary forest roads, construction of planned routes).	Practical exercises in specialized classroom, midterm exams, knowledge test, final exam B14



Methods of grading

Evaluation elements	Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students' workload outside the direct teaching	ECTS
Lectures	-	-	-	30		1
Completion of exercises and assignments for field classes (E)	20 %	Partly disordered and incomprehensible, with major corrections and within time	Fair (2)	46	30	2
		Neat, readable, with major corrections and in time	Good (3)			
		Neat, legible, with minor corrections and in time	Very good (4)			
		Neat, legible, accurate and within time	Excellent (5)			
Midterm exam I, II (PE)	(80) %	60-70 %	Fair (2)	0	60	3
		71-80 %	Good (3)			
		81-90 %	Very good (4)			
		91-100 %	Excellent (5)			
TOTAL	100 %	(Ex20+PE2x40)/100		76	90	6

Evaluation elements	Maximum points or Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students' workload outside the direct teaching	ECTS credits
Final exam* (FE)		60-70 %	Fair (2)			3
		71-80 %	Good (3)			
		81-90 %	Very good			



		91-100 %	(4) Excellent (5)			
TOTAL	100 %	(FEx80+Ex20)/100				
* students who do not pass the midterm exams during the semester shall take the final exam that makes up for 80 % of the grade, the remaining 20 % being, the grade for practical exercises						

Detailed description of evaluation elements for lectures, exercises, partial or final exams:

Elements for assessment	Description	Term	Compensation for absence
Lectures+ practical exercised	Students' attendance is checked and recorded. Students can be absent with justification from maximum 15 % of direct teaching.	Semester (60 hours of direct teaching)	-
Performance of practical exercises	Students attend practical exercises in groups. A total of 15 design exercises are carried out using a suitable GIS computer program. At the beginning of the first practical exercise, students get the appearance of the file, folder and template sheet. Based on a specific management unit, they establish a forest road network of optimal density. The files with the completed exercises are submitted for review, and assessment is given for accuracy, quality of analyzed forest accessibility and regularity of attendance.	As agreed	Exceptionally, in case of justified reason, students may subsequently perform individual practical exercises
Midterm exam 1	Students answer to pre-printed test questions, they round the exact answer, describe pictures. The written midterm exam is graded and taken into account for the final grade of this course.	As agreed	Students who have passed midterm exam 1 can take midterm exam 2
Midterm exam 2	Students answer to pre-printed test questions, they round the exact answer, describe pictures. The written midterm exam is graded and taken into account for the final grade of this course.	As agreed	Students who have passed midterm exam 2, are exempted from the written exam
Written exam	The exam can be taken by students who have attended certain practical exercises. Students answer to pre-printed test questions, they round the exact answer, describe pictures. The written midterm exam is graded and taken into account for the final grade of this course.	Exam terms	-
Oral exam	Students who pass the written exam are asked questions relating to the different parts of the course content. The following formula is used to calculate the final grade for this course: (Ex20 FEx80)/100		



Forest Products

Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
Present the division of forest products and standardization of products and development of standardization (standards and norms, classification and reporting of primary forest products according to UNECE / FAO methodology, nomenclature of commercial tree species, classification of trees according to norms, wood and non-wood forest products, legal and by-law acts, European (CEN) and International (ISO) product and Procedures standardization).	Exercises, Partial exam, Final Exam	C2
Analyze methods of forest products records (traditional and current methods, methods of measurement according to HRN and HRN EN normative systems, methods of measurement and expression of results).	Exercises, Partial exam, Final Exam	A1
Classify wood forest products according to the HRN normative system - wood for technical use, wood for chemical use and firewood, and HRN EN normative system - roundwood and HRN EN ISO for solid biofuels (wood defects, quality grading, minimum dimensions and allowed defects, quality assurance system).	Exercises, Partial exam, Final Exam	B8
Valorize other forest products (fruits and seeds of forest trees, shrubs and ground vegetation, aboveground commercial mushroom species, underground commercial mushroom species, medicinal plants, edible plants, game).	Exercises, Partial exam, Final Exam	B10



Methods of grading

Evaluation elements	Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students' workload outside the direct teaching	ECTS
Lectures (L)	-	-	-	30		1
Field work				16		0.5
Exercises (E)	10%	Partly disordered and incomprehensible, with major corrections and on time	Sufficient (2)	15		0.5
		Neat, with bigger corrections and on time	Good (3)			
		Neat, with minor corrections and on time	Very good (4)			
		Neat, accurate and timely	Excellent (5)			
Partial exam I. (Division & standardisation; Recording; Classification of coniferous timber assortments)	45%	60-70%	Sufficient (2)		10	1
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
Partial exam II (Classification of deciduous timber assortments; Non-wood forest products)	45%	60-70%	Sufficient (2)		10	1
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
TOTAL	100%	(Ex10+PEIx45+PEIIX45)/100 or (Ex10+PEIx30+OEEx60)/100		61	60	4



Evaluation elements	Maximum points or Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students' workload outside the direct teaching	ECTS credits
Written exam (WE)	30%	60-70% 71-80% 81-90% 91-100%	Sufficient (2) Good (3) Very good (4) Excellent (5)		15	0.5
Oral exam (OE)	60%	60-70% 71-80% 81-90% 91-100%	Sufficient (2) Good (3) Very good (4) Excellent (5)		45	1.5
TOTAL	100%	(Ex10+PEI_x45+PEII_x45)/100 or (Ex10+WEx30+OEx60)/100				

Evaluation elements	Maximum points or Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students' workload outside the direct teaching	ECTS credits
Final exam* (FE)		60-70% 71-80% 81-90% 91-100%	Sufficient (2) Good (3) Very good (4) Excellent (5)			02
TOTAL	100%	(FEx90+Ex10)/100				

*The final exam consists of the written and oral exams. Students take the final exam if they did not pass both partial exams.



Detailed description of evaluation elements for lectures, exercises, partial or final exams:

Evaluation elements	Description	Deadline	Compensation
Lectures and exercises	The attendance is checked and the attendance, and the activity of the students is recorded. The student can justifiably absent from a maximum of 20% of the lectures and 10% of the exercises.	semester (45 hours of direct teaching)	-
Field work	The attendance is checked and the attendance, and the activity of the students is recorded.	semester (16 hours of direct teaching)	
Exercises preparation	Exercises are attended in groups. At the beginning of the first exercise, students will get task templates. The accuracy and regularity are evaluated.	in accordance with the agreed terms	Exceptionally, in the case of a justified reason, the student can compensate the absence of the individual exercise
Partial exam I	The achievement of learning outcomes 1 and 2 and part of learning outcome 3 related to the classification of timber assortments of conifers is checked.	12 th week	-
Partial exam II	The achievement of learning outcome 4 and the part of learning outcome 3 related to the classification of deciduous timber assortments is checked.	15 th week	
Written exam	The exam can be attended by students who have completed exercises but did not pass the exam through the colloquium. Students solve the calculation task and answer the questions. The written exam is graded and participates in the final grade of the course.	Exam terms	-
Oral exam	Students who pass a written exam are asked questions from different parts of the program content. The final grade is calculated according to formula: (Ex10+WEx30+OEx60)/100	Exam terms	



Integrated Forest Protection

Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
Describing the protection measures in ash and oak forests (protection measures against the pathogens, determining the number of populations of defoliants, large game and small rodents, calculating the pest's critical numbers).	Written and oral exam	B2, B5
Presenting the protection measures in common beech, fir and spruce forests (protection measures against different pests, determination of the bark beetles abundance).	Written and oral exam	B2, B5
Valorizing the protection measures in Mediterranean forests (abiotic and biotic factors, organization of terrestrial fire protection).	Written and oral exam	B2, B5
Suggesting the use of different machinery in forest protection (Techniques and Technologies).	Written and oral exam	B12, B16
Design and present a forest protection plan regarding the current pest population	Written and oral exam	B2, B5, B12
Determining the pest abundance and protective measures.	Written and oral exam	B2, B5, B12
Classify different devices in plant protection (pressure atomizer, rotary, pneumatic).	Written and oral exam	B12, B16



Methods of grading

Evaluation elements	Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students' workload outside the direct teaching	ECTS
Lectures	-	-	-	30	-	1
Exercise	-	-	-	15	-	0.5
Seminar (S)	30%	-	-	-	15	0.5
Exam (E)	70%	60-74%	Sufficient (2)	-	30	1
		75-84%	Good (3)			
		85-94%	Very good (4)			
		95-100%	Excellent (5)			
Field work		-	-	16	15	1
TOTAL	100%	(Sx30+Ex70)/100		51	60	4

Evaluation elements	Maximum points or Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students' workload outside the direct teaching	ECTS credits
Final exam (FE)	100 %	60-74% 75-84% 85-94% 95-100%	Sufficient (2) Good (3) Very good (4) Excellent (5)			1
TOTAL	100%	(Sx30+Ex70)/100				



Detailed description of evaluation elements for lectures, exercises, partial or final exams:

Evaluation elements	Description	Deadline	Compensation
Attendance of lectures and exercises	The student attendance is checked and recorded. Student absence of max 15% of lectures is allowed.	semester (15 hours of direct lecturer)	-
Attendance of exercises	The student attendance is checked and recorded. Student absence of max 15% of lectures is allowed.	semester (15 hours of direct lecturer)	Attendance of exercises
Writing seminar	Students write and present their seminar work related to relevant forest protection topics	semester	-
Field work	As part of the course, a two-day field lesson is conducted	2 days	
Written exam	Written exam must be positively graded (2-5) so the student may participate in oral exam.	Exam terms	
Oral exam	Students, which passed written exam, participate in oral exam and get their final grade.	Exam terms	



Silviculture

Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
Valorize of virgin forest and close to nature forest management (development cycle, texture and structure, comparison of structure, production, regeneration and selection in the rainforest and the management forest).	Exercises, Final exam	B5
Suggest the silvicultural procedures in forest stands (the principles of rationalization in silviculture, method of classifying trees in the stands, the method of thinning, the thinning intensity, Assmann's theory).	Exercises, Final exam	B2
Present special forest regeneration methods (biological, ecological and silvicultural preconditions of natural regeneration and their impact on the success of natural regeneration, comparison of generative and vegetative and natural, artificial and combined regeneration, regeneration theory on small surfaces, theory of combined regeneration methods - additive and substitution combinations).	Exercises, Final exam	B2
Valorize special methods of forest management and silviculture forestry in the conditions of habitat change (two-layered high forest, high forest with reserves, pioneering and transitional forest management).	Exercises, Final exam	B2
Present conversions (replacement, conversion of coppice forest to high forest, conversion of coppice with standard forest to high forest).	Exercises, Final exam	B2
Compare silvicultural techniques by forest stands and sustainability (silvicultural planning, forest biodiversity, concept of permanent forest).	Exercises, Final exam	B2



Methods of grading

Evaluation elements	Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students' workload outside the direct teaching	ECTS
Lectures (L)	-	-	-	30	0	1
Exercises (E)	20%	Partly disordered and incomprehensible, with major corrections and on time	Sufficient (2)	54	10	2
		Neat, with bigger corrections and on time	Good (3)			
		Neat, with minor corrections and on time	Very good (4)			
		Neat, accurate and timely	Excellent (5)			
Exam (WE)	80%	60-70%	Sufficient (2)	0	60	2
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
TOTAL	100%	(Ex20+WEx80)/100		84	70	5



Evaluation elements	Maximum points or Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students' workload outside the direct teaching	ECTS credits
Final exam (FE)		60-70% 71-80% 81-90% 91-100%	Sufficient (2) Good (3) Very good (4) Excellent (5)			2
TOTAL	100%	(FE_x80+Ex₂₀)/100				

Detailed description of evaluation elements for lectures, exercises, partial or final exams:

Evaluation elements	Description	Deadline	Compensation
Attendance of lectures and exercises	The attendance is checked and the attendance of the students is recorded. A student may justifiably be absent with a maximum of 15% of direct teaching hours.	semester (84 hours of direct lecturer)	-
Written exam	Examinations can be attended by students who have completed exercises and field teaching. The students in the printed exam answer the questions asked. The written exam is evaluated and participates in the final grade of the subject.	Exam terms	-
Oral exam	Students who pass a written exam are asking questions from different parts of the program content.	Exam terms	-



Forest Management

Learning outcomes and evaluation methods

Learning outcomes (LO)	Knowledge proof	Connection with the study program LO
To analyze growth and increment of individual trees (height growth and increment dynamics, diameter, cross section area, volume increment, value of certain tree species)	Practise correction and validation, preliminary exams, final proof	B2, B4, D1, D4
To present development and stand increment (in even-aged stands, pure and mixed; growth and increment of uneven-aged stands, influence of management and habitat changes on tree and stand increment, measurement and stand volume increment determination methods).	Practise correction and validation, preliminary exams, final proof	B2, B4, D2
To formulate forest management planning (management programs, general forest management plan, spatio-temporal forest management, management planning in even-aged, uneven-aged and mixed stands – forest and stand level).	Field exercise, correction and validation, preliminary exams, final proof	B2, B4, C1, C6, D2
To evaluate limiting factors when prescribing performing tree felling (age structure, maximum felling intensity, forest accessibility, health status, calamities, market, regulation tracking and implementation, revision and additional plan revision).	Field exercise, correction and validation, preliminary exams, final proof	A1, B2, B4, C1, C6



Methods of grading

Evaluation elements	Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students' workload outside the direct teaching	ECTS
Lectures (L)	-	-	-	30		1
Exercises (E)	20%	Partially not clear, with major corrections but on time	Sufficient (2)	15	15	1
		Clear, with major corrections but on time	Good (3)			
		Tidy, clear, with minor corrections and on time	Very good (4)			
		Tidy, clear, without necessary corrections and on time	Excellent (5)			
Field trip practice (FP)	-	-	-	16	15	1
Partial exam 1 (PE1)	40%	[60-70%)	Sufficient (2)		30	1
		[70-79,9%)	Good (3)			
		[80-90%)	Very good (4)			
		[90-100%]	Excellent (5)			
Partial exam 2 (PE2)	40%	[60-70%)	Sufficient (2)		30	1
		[70-80%)	Good (3)			
		[80-90%)	Very good (4)			
		[90-100%]	Excellent (5)			
Total	100%	(Ex20+ PE1x40+PE2x40)/100		61	90	5



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 UNIVERSITY OF ZAGREB FACULTY OF FORESTRY AND WOOD TECHNOLOGY

Evaluation elements	Maximum points or Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students' workload outside the direct teaching	ECTS points
Final exam* (FE)		(60-70%) (70-80%) (80-90%) (90-100%)	Sufficient (2) Good (3) Very good (4) Excellent (5)			2
TOTAL	100%	(FEx80+Ex20)/100				
* students which during semester do not pass the exam through colocvium must attend the exam which comprises 80% of grade. Remaining 20% is grade from practice.						



Detailed description of evaluation elements for lectures, exercises, partial or final exams:

Evaluation elements	Description	Deadline	Compensation
Attendance of lectures and exercises	Student presence is recorded. Maximum lecture absence of 20% and practice absence of 10% are tolerated.	Semester (45 hours of classes)	-
Field practice	Student presence and activity during practice is monitored. Field practice attendance is obligatory.	Semester (16 hours of classes)	In certain cases of valid explanation for not being able to attend in field practice student is given a seminar and partial exam containing problematics explained in field practice trip
Exercises (E)	In the beginning, students are instructed how practice files should look. At the beginning of every practice, they get templates and learning materials which contain a description of practice thematics with examples. Every practice is evaluated based on accuracy, tidiness, and regularity of practice construction and submission.	According to calendar arrangement	-
Partial exam	To be able to attend the first colovium students are required to have correct practice that is related to the colovium. Colovium is comprised of 12 questions. To pass the colovium student needs to collect 60% of maximal points. To attend the second colovium students are required to pass the first coloviom and have correct practice course. Second colovium is comprised of 12 questions. To pass the colovium student needs to collect 60% of maximal points. Students which pass both coloviums are passed the exam and get the grade.	Middle and end of semester	-
Written exam (WE)	The exam comprises of 12 questions and includes theoretical and practical knowledge that student learned during lectures, practice and field work. To pass the exam student needs to correctly answer 60% of questions.	Exam schedule defined on the beginning of semester	-
Oral exam (OE)	Requirement for approaching an oral exam is passed written exam within timeframe of registered exam date Theoretical knowledge with subject understanding of lectured classes is checked. Final grade is calculated according to following formula (WEx40+OEx50+Ex10)/100		-



Mechanical Technologies of Wood Processing

Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
Defining basic procedures of mechanical processing of wood.	Partial exams, final exam	B1, B8, C2
Determination and valuation of timber or logs for mechanical processing of wood.	Partial exams, final exam	B1, B8, C2
Determination and evaluation of wood quality from the field of mechanical processing of wood.	Partial exams, final exam	B1, B8, C2
Determination and valuation of wood defects in mechanical processing of wood.	Partial exams, final exam	B1, B8, C2
Valuation and comparative analysis of the properties and aspects of trees for mechanical processing of wood.	Partial exams, final exam	B1, B8, C2

Methods of grading

Evaluation elements	Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students' workload outside the direct teaching	ECTS
Lectures (L)	-	-	-	15		0.5
Exam (E)	100%	60-70%	Sufficient (2)		45	1.5
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
TOTAL	100%	(Ex100)/100		15	45	2



Evaluation elements	Maximum points or Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students' workload outside the direct teaching	ECTS credits
Final exam (FE)	100 %	61-70% 71-80% 81-90% 91-100%	Sufficient (2) Good (3) Very good (4) Excellent (5)			1.5
TOTAL	100%	(FEx100)/100				

Detailed description of evaluation elements for lectures, exercises, partial or final exams:

Evaluation elements	Description	Deadline	Compensation
Attendance of lectures and exercises	Students attendance is checked and notified. Student can miss 15% of the classes justifiably the most.	semester (15 hours of direct lectures)	-
Written and oral exam	The grade given on oral exam is final and it makes 100% of the grade.	In given exam periods	



Forest Fires

Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
Categorize a concrete forest fire according to the learned typology.	seminar work, final exam	B1, B5, B16
Analyze statistical numerical and graphical data on fire records at year level.	seminar work, final exam	B1, B5, B16
Interpret fire season based on insights into all parameters affecting the frequency and intensity of forest fires.	seminar work, final exam	B1, B5, B16
Evaluate the map of risk and critically challenge or confirm the account of their own insights into the available data.	seminar work, final exam	B1, B5, B16
Actively monitor and apply new legal and organizational solutions and accordingly adapt the existing forest fire, forestry, enterprise, forest owner's fire prevention system.	seminar work, final exam	B1, B5, B16



Methods of grading

Evaluation elements	Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students' workload outside the direct teaching	ECTS
Lectures (L)				15	0	1
Seminar (S)	50%	The student works on a given problem/topic through the seminar	50-64% Sufficient (2)	0	20	0.5
			65-74% Good (3)			
			75-84% Very good (4)			
			85-100% Excellent (5)			
Exam (E)	50%	65-74%	Sufficient (2)	0	25	0.5
		75-84%	Good (3)			
		85-94%	Very good (4)			
		95-100%	Excellent (5)			
TOTAL	100%	(Sx50+Ex50)/100		15	45	2

Evaluation elements	Maximum points or Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students' workload outside the direct teaching	ECTS credits
Final exam (FE)		60-70%	Sufficient (2)			0.5
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%				
		Excellent (5)				
TOTAL	100%	(Sx50+FEx50)/100				
* * final exam without a delivered and defended seminar is not possible						



Detailed description of evaluation elements for lectures, exercises, partial or final exams:

Evaluation elements	Description	Deadline	Compensation
Seminar (S)	In the form of a seminar presentation / presentation, the student demonstrates learned knowledge of the issues of prevention and implementation of forest fires prevention (according to the program). Elaborates the problem in a structured way based on the given example scenario.	Second third of the semester	No compensation
Exam	Students who present the seminar and their seminar is evaluated and fulfill their student obligations (attendance) get the right to go to final exam Final grade is the result of a combination of a seminar evaluation and an oral final exam. The final written exam cannot be equally accessible to a student who did not make the seminar.	In given exam periods	



Forest Fire-prevention Infrastructure

Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
Identify factors affecting forest fire and protection issues (forest fire protection measures with emphasis on preventive, technical measures).	Seminar, Final exam	B7
Present forest fire roads - planning, construction, and maintenance/reconstruction (basic forest fire fighting infrastructure components: forest fire-fighting roads, floodplains, water reservoirs, manual reservoirs, observation systems, connection systems, and their planning, construction and maintenance/reconstruction).	Seminar, Final exam	B14
Present the machines for the construction and maintenance of forest fire-fighting roads and fire-fighting vehicles (machinery, techniques and technologies for the construction and maintenance of forest fire-fighting roads and fire-fighting vehicles).	Seminar, Final exam	B7

Methods of grading

Evaluation elements	Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students' workload outside the direct teaching	ECTS
Lectures (L)	-	-	-	15		0.5
Seminar (S)	30%				5	0.5
Final Exam (FE)	70%	60-70%	Sufficient (2)		40	1
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
TOTAL	100%	(FEx100+Sx30)/100		15	45	2



Evaluation elements	Maximum points or Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students' workload outside the direct teaching	ECTS credits
Final exam (FE)	70 %	60-70% 71-80% 81-90% 91-100%	Sufficient (2) Good (3) Very good (4) Excellent (5)			1
TOTAL	70%	(FEx70+Sx30)/100				

Detailed description of evaluation elements for lectures, exercises, partial or final exams:

Evaluation elements	Description	Deadline	Compensation
Attendance of lectures	The attendance is checked and the attendance of the students is recorded. A student may justifiably be absent with a maximum of 20% of direct teaching hours.	semester (15 hours of direct lecturer)	-
Seminar (S)	In the first half of the semester, the student is assigned a seminar topic, which the student prepares during the semester and submits it to the teacher for review at the end of the semester. If it is evaluated positively, it is accepted as a completed seminar paper.	according to the agreed time	
Final exam	Students take only the written exam. Students answer the questions on a pre-made printed exam. The written exam is graded and constitutes the final grade of the course. The final grade in the course is obtained according to the formula: (FEx70+Sx30)/100	Exam terms	-



Alternative Forest Vehicle Drives

Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
To judge the need to use hybrid forest vehicles.	Written exam	B6, B16
To analyze the general and operational characteristics of energy storages.	Written exam	B6, B16
To select optimal alternative drives for different types of forest vehicles and for different forest works	Written exam	B6, B16
To compare the advantages and disadvantages of technologies in the application of the new generation of forest vehicles.	Written exam	B6, B16
To critically judge the cost-effectiveness of using alternative forest vehicle drives.	Written exam	B6, B16

Methods of grading

Evaluation elements	Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students' workload outside the direct teaching	ECTS
Lectures	-	-	-	15	0	0.5
Exam (WE)	50 %	60-70 %	Fair (2)	0	45	1.5
		71-80 %	Good (3)			
		81-90 %	Very good (4)			
		91-100 %	Excellent (5)			
TOTAL	100%	(Ex100)/100		15	45	2



Evaluation elements	Maximum points or Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students' workload outside the direct teaching	ECTS credits
Final exam* (FE)		60-70% 71-80% 81-90% 91-100%	Fair (2) Good (3) Very good (4) Excellent (5)			1.5
TOTAL	100%	(FEx100)/100				
* students who do not pass the midterm exams during the semester shall take the final exam that makes up for 80 % of the grade, the remaining 20 % being the grade for practical exercises						

Detailed description of evaluation elements for lectures, exercises, partial or final exams:

Elements for assessment	Description	Term	Compensation for absence
Lectures	Attendance of students is checked and recorded during classes. A student can be excused from a maximum of 20% of direct teaching hours.	Semester (15 hours of direct teaching)	-
Written exam	Students answer the questions and solve problem tasks on a pre-prepared printed exam. The written exam is graded and forms the final course grade. The final grade is obtained according to the formula (WEx100)/100	Exam term	-



Hunting management planning

Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
Explain the problems of large and small game management in open hunting grounds, game farms, within protected and specially regulated facilities.	Seminar, oral exam	C6, D3
Establish standards for the development of hunting management plans and studies, interpret the capacity of habitats, population structures of individual species of game and other animal species.	Seminar, oral exam	A1, A3, C6, D4
Define habitat conditions, species preference, population density, population and biological growth, anthropogenic and all other impacts on wildlife and other animal species.	Seminar, oral exam	C6
Introduction to the potential of game as non-wood forest products through the value of shooting, trophies and produced game meat.	Seminar, oral exam	C6, D3
Explain management under special conditions, Management Plans and action plans for protected game species.	Seminar, oral exam	C6, D3

Methods of grading

Evaluation elements	Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students' workload outside the direct teaching	ECTS
Lectures	-	-	-	15	0	0.5
Seminar (S)	50 %	The student works on a given problem/topic through the seminar	50-64 % Fair (2)		20	0.5
			65-74 % Good (3)			
			75-84 % Very good (4)			
			85-100 % Excellent (5)			



Exam (WE)	100 %	65-74 %	Fair (2)	0	25	0.5
		75-84 %	Good (3)			
		85-94 %	Very good (4)			
		95-100 %	Excellent (5)			
TOTAL	100%	(Ex100)/100		15	45	2

Evaluation elements	Maximum points or Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students' workload outside the direct teaching	ECTS credits
Final exam* (FE)		65-74%	Fair (2)			0.5
		75-84%	Good (3)			
		85-94%	Very good (4)			
		95-100%	Excellent (5)			
TOTAL	100%	(FEx100)/100				

* students who do not pass the midterm exams during the semester shall take the final exam that makes up for 80 % of the grade, the remaining 20 % being the grade for practical exercises

Detailed description of evaluation elements for lectures, exercises, partial or final exams:

Elements for assessment	Description	Term	Compensation for absence
Seminar	In the form of a seminar presentation / presentation, the student demonstrates learned knowledge of the subject (according to the program). Elaborates the problem in a structured way based on the given example scenario.	Second third of the semester	No compensation
Exam	Students who present the seminar and their seminar is evaluated and fulfill their student obligations (attendance) get the right to go to final exam Final grade is the result of a combination of a seminar evaluation and an oral final exam. The final written exam cannot be equally accessible to a student who did not make the seminar.	In given exam periods	



Forest Road Design

Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
Explain forest road design and the basic elements of the transport of timber (determine the towing capacity for motor vehicles, resistance to the motion of vehicles, trucks, truck units, primary and secondary legislation, ordinances, guidelines, regulations, etc., direct/indirect pole setting for forest roads, design procedure for forest roads, documentation for forest road design).	Practical exercises in the computer classroom, midterm exams, knowledge test, final exam	B3
Analyze the detailed positioning plan of the forest road and use computer programs for the design of forest roads (zero line, operational and axial polygon of the forest road, design software, develop the final design for a forest road).	Practical exercises in the computer classroom, midterm exams, knowledge test, final exam	B12; B14; B15
Describe the staking out of main points and the methods for staking out detailed points of horizontal curves, transition curves and serpentine, detailed construction marking of the forest road cross-sections for the beginning of construction in the field.	Field classes, practical exercises in the computer classroom, midterm exams, knowledge test, final exam	B12; B14; B15
Explain the longitudinal section, the cross section and the lower layer of a forest road (written and graphical longitudinal cross section, design the incurved grade level, curved grade level, select the vertical curve radius, normal/type/orientation cross-sections, advantages and disadvantages, possible problems and restrictions in the application of type-cross sections in specific cases).	Practical exercises in the computer classroom, midterm exams, knowledge test, final exam	B12; B14; B15
Recommend the structures for the safety/protection of the lower structure of a forest road and drainage facilities (retaining walls, types and forms of retaining walls, stability check and dimensioning of the retaining walls, combination retaining and revetment walls, the effects of water on forest roads, surface and underground drainage facilities for forest roads).	Practical exercises in the computer classroom, midterm exams, knowledge test, final exam	B12; B14; B15
Evaluate the pavement construction and the causes of damage on forest roads	Practical exercises in the computer classroom, midterm exams, knowledge	B12; B14; B15



(dimensioning of pavement constructions, test, final exam
stone pavements, causes of damage on forest
roads, develop the final design of a forest
road, positioning of road structures, final
adjustments to the detailed
positioning/situation plan).

Methods of grading

Evaluation elements	Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students' workload outside the direct teaching	ECTS
Lectures	-	-	-	30	0	1
Completion of exercises and assignments for field classes (E)	15%	Partly disordered and incomprehensible, with major corrections and within time	Fair (2)	62	0	1,5
		Neat, legible, with major corrections and within time	Good (3)			
		Neat, legible, with minor corrections and within time	Very good (4)			
		Neat, legible, accurate and within time	Excellent (5)			
Writing seminar (S)	5%				15	0,5
Midterm exams (I and II)	(80)%	60-70 %	Fair (2)	0	60	3
		71-80 %	Good (3)			
		81-90 %	Very good (4)			
		91-100 %	Excellent (5)			
TOTAL	100%	(Ex15 + Sx5+PE2x40)/100		92	75	6



Evaluation elements	Maximum points or Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students' workload outside the direct teaching	ECTS credits
Final exam* (FE)		60-70% 71-80% 81-90% 91-100%	Fair (2) Good (3) Very good (4) Excellent (5)			3
TOTAL	100%	(FEx80+Ex15 + Sx5)/100				
* students who do not pass the midterm exams during the semester shall take the final exam that makes up for 80 % of the grade, the remaining 20 % being the grade for practical exercises and seminars						

Detailed description of evaluation elements for lectures, exercises, partial or final exams:

Elements for assessment	Description	Term	Compensation for absence
Lectures + practical exercises	Students' attendance is checked and recorded. Students can be absent with justification from maximum 15 % of direct teaching.	Semester (92 hours of direct teaching)	-
Completion of practical exercises	Students attend practical exercises in groups. A total of 15 design exercises are carried out using a suitable computer program. At the beginning of the first practical exercise, students get templates with data on one forest road, and the appearance of the file where all documents of the designed forest road will be stored after certain exercises. Assessment is given for accuracy, commitment and attendance in exercises.	As agreed	Exceptionally, in case of justified reason students may subsequently perform individual practical exercises
Seminar	Students assigned in groups prepare and present their seminar work related to the relevant topic in forest road design	semester	
Midterm exam I	All students can take the first midterm exam. Students provide answers to pre-printed test questions, they round the correct answers, describe pictures. The written midterm exam is graded and taken into account for the final grade of this course.	7 th week	
Midterm exam II	Only students who passed the first midterm exam can take the second midterm exam. Students provide answers to pre-printed test questions, they round the correct answers, describe pictures. The written midterm exam is graded and taken into account for the final grade of this course.	15 th week	



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Written exam	The exam can be taken by students who attended practical exercises. Students provide answers to pre-printed test questions, they round the correct answers, describe pictures. The written midterm exam is graded and taken into account for the final grade of this course.	Exam term	-
Oral exam	Students who pass the written exam are asked questions relating to the different parts of the course content. The following formula is used to calculate the final grade for this course: (Ex15 + Sx5 + FEx80)/100		



Economics of Forest Company

Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
To analyse capital and investments in forestry (meaning of the capital in forestry, fixed property and working capital in forestry, categories and importance of investments in forestry).	Exercise, final exam	C1
To present costs, calculation and cost management in forestry (costs in production processes, types and methods of calculation, price structure in creation of specific calculation for characteristic productions and forest products).	Exercise, final exam	C4
To compare economic analyse of business performance in forest company and business indicators (balance sheet, profit and loss account, cash flow, debt ratio, liquidity, activity, profitability, investment and market value).	Exercise, final exam	C4
To estimate specifics of planning processes and business plan (economic statements, influence of forest management planning on business results, functioning of investments and business plans in forest management, goals, contents and shape of the business plan).	Exercise, final exam	B1,C4
To compare economic policy instruments and processes of strategic planning (monetary system, fiscal system, overseas relations and income policy, environment analyses, added value chain analyse, controlling instruments).	Exercise, final exam	B1, C4



Methods of grading

Evaluation elements	Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students' workload outside the direct teaching	ECTS
Lectures (L)	10%	Minimal number of attendance in the class	Sufficient (2)	30	0	1
			Good (3)			
			Very good (4)			
		Attendance and active participation in the teaching during semester	Excellent (5)			
Exercises (E)	30%		Sufficient (2)	15	0	0.5
			Good (3)			
			Very good (4)			
		Regular submission of exercise tasks without corrections	Excellent (5)			
Field work (FW)	10%	60-70%	Sufficient (2)	8	0	0.5
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
Midterm exam (ME) I	25%	60-70%	Sufficient (2)		30	1
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
Midterm exam (ME) II	25%	60-70%	Sufficient (2)		30	1
		71-80%	Good (3)			



		81-90%	Very good (4)			
		91-100%	Excellent (5)			
Total	100%	(Lx10+Ex30+FWx10+MEIx25+MEIEx25)/100		53	60	4

Evaluation elements	Maximum points or Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students' workload outside the direct teaching	ECTS credits
Final exam (FE)		60-70% 71-80% 81-90% 91-100%	Sufficient (2) Good (3) Very good (4) Excellent (5)			2
TOTAL	100%	(Lx10+ECx30+FWx10+FEEx50)/100				

Detailed description of evaluation elements for lectures, exercises, partial or final exams:

Evaluation elements	Description	Deadline	Compensation
Attendance of lectures and exercises	Checking the attendance of students on lectures. Student can miss the lectures justifies more than 15% of exercises.	semester (45 hours of direct lecturer)	-
Exercises	Exercises are individual. Students are receiving exercise templates in the beginning of the course, and shape of the folder and files, which will be used for the individual tasks. Accuracy, precision and regularity of assignment are evaluating.	14 days after the exercise date	Handing in after the deadline means completing one additional exercise in agreement with the lecturer
Midterm exam I	Checking for achievement learning outcomes C4 in relation with investment analysis.	Week 9.	
Midterm exam II	Checking for achievement learning outcomes B1, C4 in relation with business planning in forestry.	Week 15.	
Written exam	Students could attend exam with successfully and correct finished exercises. Students on printed written exam work on three calculation exams. One positive exam has 10 points. Half of the correct exam gain 5 points. Grades for	Exam terms	



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	written exam are: 15-sufficient (2) 20- good (3) 25-very good (4) 30-excellent (5)		
Oral exam	Students with positive written exam are questioned from different part of the course content. Final grade consists achieved percentage together from written and oral exam: Sufficient (2) 60% Good (3) 71% Very good (4) 81% Excellent (5) 91%		



Marketing in Forestry

Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
To determine importance, role and social responsibility of marketing in forestry (importance of marketing management, welfare marketing, green marketing, consumerism).	Exercise, final exam	C1
To present research and market segmentation, supply and demand rules, (area and marketing plan, factors and characteristics of marketing information systems, analyse and behavior of competitors, development of new products and services, market, prices and elasticity).	Exercise, final exam	C2, B11
To present product, production program, price construction and distribution.	Exercise, final exam	C2
Evaluate promotion and marketing of goods and services in forestry (economic propaganda, sales improvements, personal sale model and publicity, importance of forest products certification in company market strategy).	Exercise, final exam	B11



Methods of grading

Evaluation elements	Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students' workload outside the direct teaching	ECTS
Lectures (L)	10%	Minimal number of attendance in the class	Sufficient (2)	30	0	1
			Good (3)			
			Very good (4)			
		Attendance and active participation in the teaching during semester	Excellent (5)			
Exercises (E)	30%		Sufficient (2)	15	15	1
			Good (3)			
			Very good (4)			
		Regular submission of exercise tasks without corrections	Excellent (5)			
Midterm exam (ME) I	30%	60-70%	Sufficient (2)		15	0.5
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
Midterm exam (ME) II	30%	60-70%	Sufficient (2)		15	0.5
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
Total	100%	(Lx10+Ex30+MEIx30+MEIIx30)/100		45	45	3



Evaluation elements	Maximum points or Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students' workload outside the direct teaching	ECTS credits
Final exam (FE)	60 %	60-70% 71-80% 81-90% 91-100%	Sufficient (2) Good (3) Very good (4) Excellent (5)			1
TOTAL	100%	(Lx10+Ex30+FE60)/100				

Detailed description of evaluation elements for lecturer, exercises, partial or final exams:

Evaluation elements	Description	Deadline	Compensation
Attendance of lectures and exercises	Checking the attendance of students on lectures. Student can miss the lectures justifies more than 15% of excersises.	semester (45 hours of direct lecturer)	-
Exercises	Exercises are individual. Students are receiving exercise templates in the beginning of the course, and shape of the folder and files, which will be used for the individual tasks. Accuracy, precision and regularity of assignment are evaluating.	14 days after the exercise date	Handing in after the deadline means completing one additional exercise in agreement with the lecturer
Midterm exam I	Checking the learning outcomes C2 in relation with supply and demand, market research.	Week 9	
Midterm exam II	Checking the learning outcomes B1 in relation with marketing mix and preparation of marketing plan.	Week 15	
Written exam	Students could attend exam with successfully and correct finished exercises. Students on printed written exam work on three calculation exams. One positive exam has 10 points. Half of the correct exam gain 5 points. Grades for written exam are: 15-sufficient (2) 20- good (3) 25-very good (4) 30-excellent (5)	Exam terms	
Oral exame	Students with positive written exam are questioned from different part of the course content. Final grade consists achieved percentage together from written and oral exam: Sufficient (2) 60% Good (3) 71%		



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	Very good (4) 81% Excellent (5) 91%		
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Production Organization in Forestry

Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
Interpret the physiological and ergonomic aspects of forest work (physiology of work, ergonomic research in forestry, work load and energy consumption of forest workers, work ability).	Exercises, partial exam, final exam	B1
Analyze the elements and phases of the work preparation and work standards in forestry (objectives and tasks, elements and stages of preparation process, specificity and implementation in forestry, content and structure of work norms, forms of work norms, verification of achievement, application in forestry, rates).	Exercises, partial exam,, final exam	C1, A3
Present planning and management systems in individual segments of forestry production (features, elements, annual planning, functional and revider forest management system, public and private stakeholders in forestry operations, truck transport of wood).	Exercises, partial exam,, final exam	C1
Present the assessment of production and business efficiency in forestry – methods and approaches (features, application of classical methods i.e. indicators and non-traditional approaches in forestry, advantages and disadvantages, ecological efficiency of organizations, indicators of eco-efficiency, multi-criteria models in forestry, multicriteria decision-making methods, feasibility studies).	Exercises, partial exam,, final exam	C1, D5
Comment on the role, tasks and responsibilities of the manager in a forestry organization (fundamentals of managerial accounting, human resources and forestry personnel, work stress)	Exercises, partial exam,, final exam	C5



Methods of grading

Evaluation elements	Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students' workload outside the direct teaching	ECTS
Lectures				30		1
Field work				24		0.5
Exercises (E) and writing of seminars from field work	20%	Partly disordered and incomprehensible, with major corrections, on time	Sufficient (2)	30	10	1
		Orderly and comprehensible, with major corrections, on time	Good (3)			
		Orderly and comprehensible, with minor corrections, on time	Very good (4)			
		Orderly, comprehensible and accurate, on time	Excellent (5)			
Partial exam I i II (PE)	(80%)	60-70%	dovoljan (2)		70	2.5
		71-80%	dobar (3)			
		81-90%	vrlo dobar(4)			
		91-100%	izvrstan (5)			
TOTAL	100%	(Ex20+PEIx40+PEIIx40)/100 ili (Ex20+FEIx80)/100		84	80	5



Evaluation elements	Maximum points or Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students' workload outside the direct teaching	ECTS credits
Final exam (FE)	80 %	60-70% 71-80% 81-90% 91-100%	Sufficient (2) Good (3) Very good (4) Excellent (5)			1.5
TOTAL	100%	(FE_x80+Ex₂₀)/100				

*The final exam consists of the written and oral exams. Students take the final exam if they did not pass both partial exams.

Detailed description of evaluation elements for lectures, exercises, partial or final exams:

Evaluation elements	Description	Deadline	Compensation
Attendance of lectures, exercises and field work	The student attendance is checked and recorded. Field work and measuring exercises are mandatory. The student can justifiably be absent with a maximum of 20% of the hours of other forms of direct teaching (lectures and calculation exercises).	semester (60 hours of direct lecturer)	-
Exercises	Exercises are attended in groups. Within exercises methodical, measuring and calculating exercises are performed. Students become acquainted with measurement methods and independently solve practical problems and tasks from forestry practice. At the beginning of the first exercise, students receive templates with exercise assignments, as well as the appearance of the file, skin, and template list in which they will answer to the set tasks in printed form. The accuracy, orderliness and regularity (exercises handed on time) are evaluated	according to the agreed time	Exceptionally, in the case of a justified reason, the student works of the absence of the individual exercise
Partial exam I	The achievement of learning outcomes 1 and 2 is checked.	6 th week	
Partial exam II	The achievement of learning outcomes 3, 4 and 5 is checked.	15 th week	-
Written exam	Exam can be attended by students who solved and submitted exercises. The students in the prepared printed exam answer the questions asked and solve the calculation tasks. The written exam is evaluated and participates in the final grade of the subject	Exam terms	
Oral exam	Students who pass a written exam are asked questions from different parts of the program content. The final grade of the subject is obtained according to the formula: (FE_x80+Ex₂₀)/100		



Ergonomics of Forest Machines

Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
Get acquainted with ergonomics as a skill.	Partial exam, written exam, oral exam	C3
To determine the ergonomic and safety factors of forest machines.	Partial exam, written exam, oral exam	B6, C3
Estimate the noise level during the work of Measure ergonomic factors (cab access, cab dimensions, visibility, machine seat, controls, machine control, machine operation information, working position, winch, noise, vibration, air conditioning, gases and particles, lighting, manuals and instructions, maintenance, maintenance index).	Partial exam, written exam, oral exam	B6, C3
Create an ergonomic profile of the forest machine (use of ergonomic checklist). Adopt protection and improvement measures, select adequate means of protection.	Partial exam, written exam, oral exam	B6, C3

Methods of grading

Evaluation elements	Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students' workload outside the direct teaching	ECTS
Lectures (L)	-	-	-	15		0.5
Field work				8		0.25
Exercises (E) and writing of reports from filed work	20%	60-70% 71-80% 81-90% 91-100%	Sufficient (2) Good (3) Very good (4) Excellent (5)	15	10	0.75
Partial exam I	40%	60-70%	Sufficient (2) Good (3)		20	0.75



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		71-80%	Very good (4)			
		81-90%	Excellent (5)			
		91-100%				
Partial exam II	40%	60-70%	Sufficient (2)		20	0.75
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
TOTAL	100%	(Ex20+PEIx40+PEIIx40)/100		38	50	3

Evaluation elements	Maximum points or Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students' workload outside the direct teaching	ECTS credits
Written exam (WE)	30 %	60-70%	Sufficient (2)		15	0.75
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
Oral exam (OE)	50 %	60-70%	Sufficient (2)		25	0.75
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
TOTAL	100%	(Ex20+PEIx40+PEIIx40)/100 or (Ex20+WEx30+OEx50)/100			40	1.5



Evaluation elements	Maximum points or Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students' workload outside the direct teaching	ECTS credits
Final exam (FE)	100 %	60-70% 71-80% 81-90% 91-100%	Sufficient (2) Good (3) Very good (4) Excellent (5)			1
TOTAL	100%	(FEx100)/100				

*The final exam consists of the written and oral exams. Students take the final exam if they did not pass both partial exams.

Detailed description of evaluation elements for lectures, exercises, partial or final exams:

Evaluation elements	Description	Deadline	Compensation
Attendance of lectures, exercises and field work	The attendance is checked and the attendance of the students is recorded. Filed work and measuring exercises are obligatory. A student may justifiably be absent with a maximum of 20% of other types of direct teaching hours (lecturers and calculation exercises).	semester (38 hours of direct lectures)	-
Exercises preparation	Exercises are attended by groups. 4 measuring tasks are performed within the exercise. Students become acquainted with measurement methods, independently perform measurements and process data. At the beginning of the first exercise, students will receive templates with exercise assignments, as well as the appearance of the collage, jumper, and list of suggestions in which they will respond to the set tasks in printed form. The accuracy, regularity and regularity (time-honored exercises) are evaluated.	in accordance with the agreed terms	
Partial exam I	The achievement of learning outcomes 1 and 2 is checked..	8 th week	
Partial exam II	The achievement of learning outcomes 3, and 4 is checked.	15 th week	-
Written exam	Examinations can be attended by students who have completed exercises and field teaching. Students on printed exams receive tasks and make calculation on a separate paper. The written exam is evaluated and participates in the final grade of the subject.	Exam terms	-
Oral exam	Students who pass a written exam are asked questions from different parts of the program content. The final grade is calculated according to formula: (Ex20+FEx80)/100	Exam terms	



Forest Biomass for Energy

Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
Present production potential and forms of forest biomass for energy (sources and origin of biomass, energy forests, forms of biomass for use and trade, standards for solid biofuels from forestry, quality testing of wood chips).	Seminar, partial exam, exam	B8
Evaluate technologies and techniques of harvesting forest biomass as a solid biofuel (transport of compressed and comminuted biomass, storage, areas of application and use of forest biomass, structure of energy wood and brushwood by stand age and tree species, establishment and production of wood biomass in short rotation coppice).	Seminar, partial exam, exam	B3, B6
Evaluate the environmental suitability, use and storage of forest biomass for energy (reduction of greenhouse gas effects by using biomass, legal acts, energy plants, heat, cogeneration and trigeneration plants, forest wood biomass for pellet, briquette, charcoal production).	Seminar, partial exam, exam	B16



Methods of grading

Evaluation elements	Maximum points or Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students' workload outside the direct teaching	ECTS
Lectures	-	-	-	15		0.5
Excercises	-	-	-	15		0.5
Seminar (S)	20%	The student prepares a seminar paper based on the results of laboratory exercises.	60-70% Sufficient (2) 71-80% Good (3) 81-90% Very good (4) 91-100% Excellent (5)		15	0.5
Partial exam I (Standardization of solid biofuels, Laboratory analyses)	20%	60-70% 71-80% 81-90% 91-100%	Sufficient (2) Good (3) Very good (4) Excellent (5)		15	0.5
Partial exam II (Production and ulitization of solid biofuels)	60%	60-70% 71-80% 81-90% 91-100%	Sufficient (2) Good (3) Very good (4) Excellent (5)		30	1



Evaluation elements	Maximum points or Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students' workload outside the direct teaching	ECTS credits
Written exam (WE)	20 %	60-70% 71-80% 81-90% 91-100%	Sufficient (2) Good (3) Very good (4) Excellent (5)		15	0.5
Oral exam (OE)	60 %	60-70% 71-80% 81-90% 91-100%	Sufficient (2) Good (3) Very good (4) Excellent (5)		30	1
TOTAL	100%	(Sx20+PEIx20+PEIIx60)/100 or (Sx20+WEx20+OEx60)/100		30	60	3

Evaluation elements	Maximum points or Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students' workload outside the direct teaching	ECTS credits
Final exam* (FE)	100 %	60-70% 71-80% 81-90% 91-100%	Sufficient (2) Good (3) Very good (4) Excellent (5)			1.5
TOTAL	100%	(FEx100)/100				

*The final exam consists of the written and oral exams. Students take the final exam if they did not pass both partial exams.



Detailed description of evaluation elements for lectures, exercises, partial or final exams:

Evaluation elements	Description	Deadline	Compensation
Lectures and exercises	The attendance is checked and the attendance of the students is recorded. The student can justifiably absent from a maximum of 20% of the lectures and 10% of the exercises.	semester (30 hours of direct teaching)	-
Seminar	The student prepares a seminar paper based on the results of laboratory exercises. The seminar paper includes a description of the methods used, analysis of the results and determination of the quality class of solid biofuels.	10 th week	-
Partial exam I	The achievement of learning outcome 1 related to laboratory analyzes and classification of solid biofuels is checked.	9 th week	
Partial exam II	The achievement of learning outcomes 2 and 3 related to the acquisition/production and use of solid biofuels is checked.	15 th week	
Written exam	The exam can be taken by students who received a positive evaluation of the seminar but did not pass the exam through the colloquium. Students solve the calculation task and answer the questions. The written exam is graded and participates in the final grade of the course.	Exam terms	
Oral exam	Students who pass the written exam are asked questions from different parts of the program content. The final grade in the course is obtained according to the formula: $(S \times 20 + WEx20 + OEx60) / 100$	Exam terms	



Forest Products Trade

Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
Analyze the prices of forest products over the past few years according to the price list, domestic and international auctions and plan the sale price of all forest products according to market forecasts.	Final exam	A1, C5
Organize the sale of certain quantities of forest products according to the place of sale; standing volume, felled (and processed) volume, at the landing.	Final exam	C2
Plan and manage the delivery of wood assortments according to the deadlines of contracted customer agreement.	Final exam	B1

Methods of grading

Evaluation elements	Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students' workload outside the direct teaching	ECTS
Lectures (L)	-	-	-	15	0	0.5
Seminar paper (S)	30%	60-70%	Sufficient (2)	0	15	0.5
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
Oral exam (OE)	80%	60-70%	Sufficient (2)	0	30	1
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
TOTAL	100%	(Sx30+OEx70)/100		15	45	2



Evaluation elements	Maximum points or Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students' workload outside the direct teaching	ECTS credits
Final exam (FE)		60-70% 71-80% 81-90% 91-100%	Sufficient (2) Good (3) Very good (4) Excellent (5)			1
TOTAL	100%	(FE_x70+S_x30)/100				

Detailed description of evaluation elements for lectures, exercises, partial or final exams:

Evaluation elements	Description	Deadline	Compensation
Attendance of lectures and exercises	The attendance is checked and the attendance of the students is recorded. A student may justifiably be absent with a maximum of 15% of direct teaching hours.	semester (15 hours of direct lecturer)	-
Written seminar paper	The student prepares a seminar paper on a given topic. The quality of the seminar work is evaluated.	15. week	
Oral exam	Students are asked questions from different parts of the program content.	Exam terms	



Technologies of Forest Road Construction

Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
Recommend options and select suitable, optimal technology for construction/reconstruction and maintenance/repair of forest roads.	Knowledge test, final exam	B7
Recommend and select the most suitable class and type of construction equipment for various type of works during construction/reconstruction and maintenance/repair of forest roads.	Knowledge test, final exam	B14
Anticipate difficulties that can occur during the construction/reconstruction of forest roads in flat areas and hilly and mountainous areas (slopes) and recommend measures to avoid/minimize them.	Knowledge test, final exam	B14

Methods of grading

Evaluation elements	Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students' workload outside the direct teaching	ECTS
Lectures	-	-	-	15	0	0.5
Seminar (S)	25%	Student through the seminar process the given problem / topic	50-64% Fair (2)	0	15	0.5
			65-74% Good (3)			
			75-84% Very good (4)			
			85-100% Excellent (5)			
Exam (E)	75%	60-70 %	Fair (2)	0	30	1
		71-80 %	Good (3)			
		81-90 %	Very good (4)			
		91-100 %	Excellent (5)			
TOTAL	100 %	(S2x12,5+Ex75)/100		15	45	2



Evaluation elements	Maximum points or Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students' workload outside the direct teaching	ECTS credits
Final exam* (FE)		60-70 % 71-80 % 81-90 % 91-100 %	Fair (2) Good (3) Very good (4) Excellent (5)			1
TOTAL	100%	(S2x12,5+FEx75)/100				

Detailed description of evaluation elements for lectures, exercises, partial or final exams:

Evaluation elements	Description	Deadline	Compensation
Lectures	Students' attendance is checked and recorded. Students can be absent with justification from maximum 15 % of direct teaching.	Semester (15 hours of direct teaching)	-
Assignment	At the beginning of the first lecture students are randomly assigned topics for their assignments. Students should thematically elaborate the topics, prepare a presentation and make an oral presentation. Students are assessed for quality of the content, the layout of the presentation and the presentation itself.	As agreed	
Written exam	Only students who have completed the assignment can take the exam. Students provide answers to pre-printed test questions, they round the correct answers, describe pictures. The written exam is graded and taken into account for the final grade of this course.	Exam terms	-
Oral exam	Students who pass the written exam are asked questions relating to the different parts of the course content. The following formula is used to calculate the final grade for this course: (S2x12,5+FEx75)/100		



Evaluation of Forest Resources

Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
To decompose ways and goals of forest value calculation and analyse total economic value concept.	Final exam	A2
Critical judgment of traditional and modern methods of calculation with and without demand curve, for environmental products and services values.	Final exam	C4, B11
To reassess different methods and models of estimation forest values in Croatia with goal of calculation total economic value of forest management unit.	Final exam	B1

Methods of grading

Evaluation elements	Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students' workload outside the direct teaching	ECTS
Lectures (L)	10%	Minimal number of attendance in the class	Sufficient (2)	15	0	1
			Good (3)			
			Very good (4)			
		Attendance and active participation in the teaching during semester	Excellent (5)			
Exam (E)	90%	60-70%	Sufficient (2)		45	1
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
TOTAL	100%	(Lx10+Ex90)/100		15	45	2



Evaluation elements	Maximum points or Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students' workload outside the direct teaching	ECTS credits
Final exam (FE)		60-70% 71-80% 81-90% 91-100%	Sufficient (2) Good (3) Very good (4) Excellent (5)			1
TOTAL	100%	(Lx10+FE_x90)/100				

Detailed description of evaluation elements for lectures, exercises, partial or final exams:

Evaluation elements	Description	Deadline	Compensation
Attendance of lectures	Checking the attendance of students on lectures.	semester (15 hours of direct lecturer)	-
Oral exam	Students with positive written seminar are questioned from different part of the course content. Final grade consists achieved percentage together from written and oral exam: Sufficient (2) 60% Good (3) 71% Very good (4) 81% Excellent (5) 91%	Exam terms	



Planning of Technological Operations

Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
Analyse elements of strategic-tactical planning of timber harvesting (terrain classification for forestry operations and mobility model of a cable skidder).	Seminar, Final exam	B1, B6
Evaluate the tactical-operational planning of timber harvesting operations (components of tactical-operational planning of timber harvesting, timber harvesting operations in space and time, operational planning and supervision of timber harvesting procedures, logistics of timber harvesting in a harvester – forwarder system).	Seminar, Final exam	C1, B12
Determine the cost calculations for timber harvesting (types of costs and methods of cost calculations).	Seminar, Final exam	B3, B7

Methods of grading

Evaluation elements	Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students' workload outside the direct teaching	ECTS
Lectures (L)	-	-	-	15	0	0.5
Designing seminar papers (S)	20%	60-70%	Sufficient (2)	0	15	0.5
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
Final exam (FE)	80%	60-70%	Sufficient (2)	0	30	1
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
TOTAL	100%	(FE_x80+S_x20)/100		15	45	2



Evaluation elements	Maximum points or Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students' workload outside the direct teaching	ECTS credits
Final exam (FE)		60-70% 71-80% 81-90% 91-100%	Sufficient (2) Good (3) Very good (4) Excellent (5)			1
TOTAL	100%	(FE_x80+S_x20)/100				

Detailed description of evaluation elements for lectures, exercises, partial or final exams:

Evaluation elements	Description	Deadline	Compensation
Attendance of lectures and exercises	The attendance is checked and the attendance of the students is recorded. A student may justifiably be absent with a maximum of 15% of direct teaching hours.	semester (15 hours of direct lecturer)	-
Written seminar paper	The student prepares a seminar paper on a given topic. The quality of the seminar work is evaluated.	15. week	
Written exam	Examinations can be attended by students who have completed exercises and field teaching. The students in the printed exam answer the questions asked. The written exam is evaluated and participates in the final grade of the subject.	Exam terms	
Oral exam	Students who pass a written exam are asking questions from different parts of the program content.	Exam terms	



Innovations in Forestry

Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
Depict the state of innovation and innovativeness in forestry (significance, role and division of innovations, stages of innovation process, innovation systems and monitors, company-level innovations, factors of innovation activity, conditions for innovation activity, innovation behavior, sources of impulses and information for innovation, support and innovation constraints).	Seminar, Written exam	C5
Explain creativity and inventiveness (features of creativity and inventiveness, process and stage of creative thinking, characteristics of creative people, techniques of encouraging creative thinking, evaluation and choice of ideas/solutions).	Seminar, Written exam	B13
Expose institutional support for innovation activities and examples of good practice.	Seminar, Written exam	C1

Methods of grading

Evaluation elements	Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students' workload outside the direct teaching	ECTS
Lectures (L)				15		0.5
Seminar (S)	20	-	-	-	15	0.5
Exam (WE)	80%	60-70%	Sufficient (2)		30	1
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
TOTAL	100%	(Sx20+WEx80)/100		15	45	2



Evaluation elements	Maximum points or Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students' workload outside the direct teaching	ECTS credits
Final exam (FE)		60-70% 71-80% 81-90% 91-100%	Sufficient (2) Good (3) Very good (4) Excellent (5)			1
TOTAL	100%	(Sx20+FE_x80)/100				

Detailed description of evaluation elements for lecturer, exercises, partial or final exams:

Evaluation elements	Description	Deadline	Compensation
Attendance of lectures	Student attendance is checked and recorded. The student can justifiably be absent with a maximum of 20% of direct teaching hours.	semester (15 hours of direct lecturer)	-
Seminar	Students write and present their seminar work related to the given topic/problem	semester	
Written exam	The students in the prepared printed exam answer the questions asked and solve the problem tasks. The exam can be taken only by students who have prepared their seminar work. The written exam is evaluated and makes the final grade of the subject.	Exam terms	



Supervision of Forest Road Construction

Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
Preparation of technical documentation necessary for the implementation of the public tender procedure for the selection of the most favourable contractor for the construction/reconstruction and maintenance/repair of the forest road.	Knowledge test, final exam	B12, B14
Prepare the professional part of the contract for construction/reconstruction and maintenance/repair of the forest road.	Knowledge test, final exam	B12, B14
Making supervision of construction/reconstruction and maintenance/repair of forest roads as a construction site manager.	Knowledge test, final exam	B13, B14
Conduct supervision/control and handover report of construction/reconstruction and maintenance/repair of forest roads as a supervising engineer.	Knowledge test, final exam	B13, B14

Methods of grading

Evaluation elements	Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students' workload outside the direct teaching	ECTS
Lectures (L)				15		0.5
Seminar (S)	30%	The student works on a given problem/topic through the seminar	50-64% Fair (2)	0	15	0,5
			65-74% Good (3)			
			75-84% Very good (4)			
			85-100% Excellent (5)			
Exam (WE)	30%	60-70%	Sufficient (2)		15	0,5
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			



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Exam (OE)	40%	60-70%	Sufficient (2)		15	0,5
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
TOTAL	100%	(Sx30+WEx30+OEx40)/100		15	45	2

Evaluation elements	Maximum points or Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students' workload outside the direct teaching	ECTS credits
Final exam (FE)		60-70%	Sufficient (2)			1
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
TOTAL	100%	(S30+FEEx70)/100				



Detailed description of evaluation elements for lecturer, exercises, partial or final exams:

Evaluation elements	Description	Deadline	Compensation
Lectures (L)	Attendance of students is checked and recorded during classes. A student can be excused from a maximum of 15% of direct teaching hours.	semester (15 hours of direct teaching)	-
Seminar (S)	At the beginning of the first lecture, students are given the names of the seminars by random selection. The received seminars must be developed thematically, make a presentation and give a presentation. The quality of the processing of the content, the appearance of the presentation as well as the presentation itself are evaluated.	according to the agreed time	
Written exam	The exam can be taken by students who have presented the seminar. Students answer the questions, circle the correct answers, describe the pictures on the pre-made printed exam. The written exam is graded and participates in the final grade of the course	Exam terms	-
Oral exam	Students who pass the written exam are asked questions from different parts of the program content. The final grade in the course is obtained according to the formula $(Sx30+WEx30+OEx40)/100$		



Environmentally Sound Technologies

Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
Analyse soil compaction and rutting (soil bearing capacity, critical comment on methods of measuring soil bearing capacity, soil penetration resistance and cone index, wheel index, assessment of vehicle mobility according to WES method, soil compaction – reasons and consequences).	Exercises, Final exam	B6
Present and describe stand damage (type of erosion processes and consequences for forest stand, soil erosion as a result of timber harvesting operations, erosion intensity in different timber harvesting systems, methods and measures for the protection of waterways).	Exercises, Final exam	B6; B14
To evaluate the environmental benefits of forest machines (environmental pollution with exhaust gases and pollutants from forest machines, impact of working conditions on fuel consumption, ecological norms for exhaust gases, technical solutions for reducing the amount of harmful exhaust gases, energy balance, ecologically acceptable wood harvesting technologies, application of bio-fuels and bio-oils in forest vehicles).	Exercises, Final exam	B6
To analyse development of forest vehicles (development and construction of forest vehicles with hybrid drive, remote monitoring systems for forest machines and vehicles).	Exercises, Final exam	A2, B16



Methods of grading

Evaluation elements	Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students' workload outside the direct teaching	ECTS
Lectures (L)	-	-	-	30	0	1
Exercises (E)	20%	Djelomično neuredne i nerazumljive, s većim ispravkama i na vrijeme	Sufficient (2)	54	20	3
		Uredne, čitke, s većim ispravkama i na vrijeme	Good (3)			
		Uredne, čitke, s manjim ispravkama i na vrijeme	Very good (4)			
		Uredne, čitke, točne i na vrijeme	Excellent (5)			
Test I, II and III	80%	60-70%	Sufficient (2)		60	2
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
TOTAL	100%	(Ex20+Tx80)/100		84	80	6

Evaluation elements	Maximum points or Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students' workload outside the direct teaching	ECTS credits
Final exam (FE)	80 %	60-70%	Sufficient (2)		60	2
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
TOTAL	100%	(FE_x80+Ex₂₀)/100			60	2



*** students who do not pass the colloquium during the semester enter the exam period, which makes up 80% of the grade, and the remaining 20% is made up of grades from exercises and reports from field classes**

Detailed description of evaluation elements for lecturer, excercises, partial or final exams:

Evaluation elements	Description	Deadline	Compensation
Attendance of lectures and exercies	The attendance is checked and the attendance of the students is recorded. A student may justifiably be absent with a maximum of 15% of direct teaching hours.	semester (84 hours of direct lecturer)	-
Test I	All students can attend the first test. Students answer the questions, circle the correct answers, describe the pictures on a pre-prepared printed exam or via the Merlin platform. The test is graded and participates in the final grade of the course.	5 th week	
Test II	Students who have passed the first test can attend the second test. Students answer the questions, circle the correct answers, describe the pictures on the pre-made printed exam. The written test is graded and participates in the final grade of the course.	10 th week	
Test III	Students who have passed the first and the second test can attend the third test. Students answer the questions, circle the correct answers, describe the pictures on the pre-made printed exam. The written test is graded and participates in the final grade of the course.	15 th week	
Written exam	Examinations can be attended by students who have completed exercises and field teaching. The students in the printed exam answer the questions asked. The written exam is evaluated and participates in the final grade of the subject.	Exam terms	-
Oral exam	Students who pass a written exam are asking questions from different parts of the program content.	Exam terms	-