



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

**Undergraduate university study FORESTRY**

# **Assessment methods and criteria**

## **Academic Year 2023/24.**



## List of compulsory and elective courses

Year of study: I							
Semester: Winter							
COURSE	COURSE CODE	L	E	F	e-learning	ECTS	Compulsory / Elective
Basics of Chemistry	226034	45	15	0		6.0	Compulsory
Mathematics	33852	45	45	0		7.0	Compulsory
Petrology with geology	229682	30	15	0		4.0	Compulsory
Forest Botany – Plant Morphology	226035	15	30	0		3.0	Compulsory
Zoology in Forestry	226036	30	30	8		6.0	Compulsory
Anatomical structure of wood	226037	30	30	0		3.0	Compulsory
<b>Error! Reference source not found.</b>	226038	0	30	0		1.0	Compulsory
<b>In total</b>		<b>195</b>	<b>195</b>	<b>8</b>	<b>0</b>	<b>30</b>	

Year of study: I							
Semester: Summer							
COURSE	COURSE CODE	L	E	F	e-learning	ECTS	Compulsory / elective
Forest Botany – Plant Systematics	226039	30	15	32		5.0	Compulsory
Biometrics	33857	30	30	0		5.0	Compulsory
Soil Science	33858	30	30	24		8.0	Compulsory
Ground surveying with basics of cartography	226040	30	45	48		7.0	Compulsory
Physiology of forest trees	33864	30	15	0		4.0	Compulsory
Physical and health education 2	226042	0	30	0		1.0	Compulsory
<b>In total</b>		<b>150</b>	<b>165</b>	<b>104</b>	<b>0</b>	<b>30</b>	

Year of study: II							
Semester: Winter							
COURSE	COURSE CODE	L	E	F	e-learning	ECTS	Compulsory / elective
Forest mensuration	33861	45	30	16		7.0	Compulsory
Forestry phytocenology	33868	30	30	24		6.0	Compulsory
Remote sensing and GIS in forestry	33862	30	30	16		5.0	Compulsory
Bases of hunting management	33863	30	30	16		6.0	Compulsory
The basic of forest mechanization	33875	30	30	16		5.0	Compulsory
Physical and health education 3	226043		30	0		1.0	Compulsory
<b>In total</b>		<b>165</b>	<b>180</b>	<b>88</b>	<b>0</b>	<b>30</b>	

Year of study: II							
Semester: Summer							
COURSE	COURSE CODE	L	E	F	e-learning	ECTS	Compulsory / elective
Establishment of forests	33867	45	30	24		6.0	Compulsory



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Forest ecology	33869	30	30	24		6.0	Compulsory
Forest entomology	33870	30	30	24		6.0	Compulsory
Dendrology	226044	45	30	24		7.0	Compulsory
Forest Genetics	33865	30	15	0		4.0	Compulsory
Physical and health education 4	226045	0	30	0		1.0	Compulsory
<b>In total</b>		<b>180</b>	<b>165</b>	<b>96</b>	<b>0</b>	<b>30</b>	

Year of study: III							
Semester: Winter							
COURSE	COURSE CODE	L	E	F	e-learning	ECTS	Compulsory / elective
Silviculture I	33872	45	30	40		7.0	Compulsory
Basic foundations of forest regulation and planning	226046	45	30	16		6.0	Compulsory
Timber harvesting operations	226047	30	30	32		6.0	Compulsory
Basics of forest economics	33866	30	15	0		4.0	Compulsory
Nature and environmental protection	226048	30	15	0		3.0	Compulsory
Work safety in forestry	226049	30	15	8		4.0	Compulsory
<b>In total</b>		<b>210</b>	<b>135</b>	<b>96</b>	<b>0</b>	<b>30</b>	

Year of study: III							
Semester: Summer							
COURSE	COURSE CODE	L	E	F	e-learning	ECTS	Compulsory / elective
Forest Roads	33877	30	30	32		5.0	Compulsory
Organization basics in forestry	33878	30	30	24		5.0	Compulsory
Forest phytopathology	33880	30	30	16		5.0	Compulsory
Fundamentals of forest protection	226050	30	0	0		2.0	Compulsory
Professional practice	226051					2.0	Compulsory
Bachelor thesis	226052					8.0	Compulsory
<b>In total</b>		<b>120</b>	<b>90</b>	<b>72</b>	<b>0</b>	<b>27</b>	
<b>In total (compulsory)</b>		<b>1020</b>	<b>930</b>	<b>464</b>	<b>0</b>	<b>177</b>	
Foreign Language-English	226053	15	0	0		1.0	Elective
Manners of game hunting	33882	15	0	0		1.0	Elective
Forest Mushrooms	33833	15	0	0		1.0	Elective
Ornamental Dendrology	33883	15	0	0		1.0	Elective
Fires of open space	73817	15	0	0		1.0	Elective
Management of forest genetic resources	73818	15	0	0		1.0	Elective
Animal physiology	226056	15	0	0		1.0	Elective
Melliferous herbaceous plants	226059	15	0	0		1.0	Elective
Basics of digital cartography	226061	15	0	0		1.0	Elective
History of Croatian forestry	226062	15	0	0		1.0	Elective
<b>In total (elective)</b>		<b>45</b>	<b>0</b>	<b>0</b>		<b>3.0</b>	
<b>In total (study programme)</b>		<b>1065</b>	<b>930</b>	<b>464</b>	<b>0</b>	<b>180</b>	



## Learning outcomes of the study program

### Undergraduate study Forestry

#### A - general engineering competence

- A1. apply approach to experimental observing and mathematical modelling, mathematically solving research and practical problems, statistically process, present and analyse data and conclude individually based on analysed data
- A2. use relevance in maintaining, area and possibilities of basic technical components
- A3 apply skills in solving practical side of business, either by control measuring, calculations or testing verification

#### B - focused engineering competence

- B1. identify tree species based on morphological characteristics, identify parts and tree shapes and apply theoretical and practical knowledge of commercially indigenous and foreign tree species and shrubs
- B2. recognise and determine the most important types of xylophages bacteria, insects and funghi on trees species and detect wood defects incurred due to their activity
- B3 acquire basic principles of protection of forests from abiotic and biotic factors, especially fires and apply basic procedures and means in protection of forests
- B4. participate in the realization of forest management programs
- B5 perform works on inventorying forests
- B6. perform professional field works on establishing, caring for, and renewing forest stands
- B7. perform professional field works in the melioration and management of forest areas in the Mediterranean region
- B8. collaborate in preparation of ecological studies and spatial plans
- B9. apply knowledge about the forest machines, techniques and standard technologies used in forestry and above all in timber harvesting from natural forests, forest cultures and plantations
- B10. apply knowledge about techniques and technology of building forest roads

#### C - organizational engineering competence

- C1. plan and organise time study, work rationalisation, conduct works of organization of production in forestry
- C2. organise and conduct sale of timber assortments and timber products
- C3. organise and conduct work safety in forestry
- C4. conduct professional works on implementation of wildlife management programs and perform organisation od hunting areas
- C5 plan and calculate production, calculate basic indicators of successful business, compose basic financial reports, recognise and analyse types of costs

#### D - developing engineering competence

- D1. continue perfection on university graduate studies on Forestry section on Faculty of Forestry



## Connection of the courses learning outcomes with the study program learning outcomes

Course	Course code	General engineering competence			Focused engineering competence										Organizational engineering competence					Developing engineering
		A1	A2	A3	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	C1	C2	C3	C4	C5	
Basics of Chemistry	226034	+																		
Mathematics	33852	+																		
Petrology with geology	229682	+						+				+	+							
Forest Botany – Plant Morphology	226035				+															
Zoology in Forestry	226036					+	+						+							
Anatomical structure of wood	226037				+															
Physical and health education 1	226038																			+
Forest Botany – Plant Systematics	226039				+															
Biometrics	33857	+																		
Soil Science	33858			+				+					+							+
Ground surveying with basics of cartography	226040	+							+				+							+
Physiology of forest trees	33864				+					+	+									
Physical and health education 2	226042																			+
Forest mensuration	33861	+							+						+					+
Forestry phytocenology	33868	+			+			+					+							+
Remote sensing and GIS in forestry	33862			+					+				+							+
Bases of hunting management	33863	+																+		+
The basic of forest mechanization	33875			+														+		
Physical and health education 3	226043																			+
Establishment of forests	33867	+			+					+			+	+						+
Forest ecology	33869	+		+				+	+	+			+							
Forest entomology	33870						+													
Dendrology	226044				+															
Forest Genetics	33865										+									
Physical and health education 4	226045																			+
Silviculture I	33872										+									+
Basic foundations of forest regulation and planning	226046							+	+											+
Timber harvesting operations	226047														+					
Basics of forest	33866	+	+	+																+



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economics																				
Nature and environmental protection	226048											+								+
Work safety in forestry	226049																	+		
Forest Roads	33877													+						
Organization basics in forestry	33878														+					
Forest phytopathology	33880					+	+				+									
Fundamentals of forest protection	226050						+				+									
Professional practice	226051	+			+			+	+	+	+			+				+	+	
Bachelor thesis	226052	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
Foreign Language-English	226053																			+
Manners of game hunting	33882					+													+	
Forest Mushrooms	33833					+														
Ornamental Dendrology	33883									+										
Fires of open space	73817						+					+								
Management of forest genetic resources	73818							+		+		+								
Animal physiology	226056				+							+				+				+
Melliferous herbaceous plants	226059							+		+	+									
Basics of digital cartography	226061	+							+	+			+						+	+
History of Croatian forestry	226062		+																	



## Basics of Chemistry

### Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
1. to distinguish extensive and intense physical quantities	Exercises, homework, partial exams, written exams, oral exam	A1
2. to connect physical quantities for expressing the quantity (mass, quantity, volume, number) of a substance and the composition of mixtures (fractions, concentrations, molality) with SI, some exceptionally permitted and old units of measurement	Exercises, homework, partial exams, written exams, oral exam	A1
3. to apply the basic settings of the precision calculus when processing experimental results	Exercises, homework, partial exams, written exams, oral exam	A1
4. to distinguish pure substances and mixtures	Exercises, homework, partial exams, written exams, oral exam	A1
5. to recognize a substance represented by chemical symbols	Exercises, homework, partial exams, written exams, oral exam	A1
6. to connect the basic physical and chemical properties of simple inorganic and organic substances with their chemical composition	Exercises, homework, partial exams, written exams, oral exam	A1
7. to apply the relations between physical quantities for calculation based on a chemical reaction equation	Exercises, homework, partial exams, written exams, oral exam	A1
8. to distinguish the limiting reactant and the reactant in excess	Exercises, homework, partial exams, written exams, oral exam	A1
9. to connect names and chemical formulas with the basic chemical and physical properties of simple inorganic and organic substances	Exercises, homework, partial exams, written exams, oral exam	A1
10. to identify natural organic compounds (carbohydrates, amino acids, lipids, nucleic acids, alkaloids) on the basis of a representation of a structure or structure segment and put it in the relation to the basic properties	Exercises, homework, partial exams, written exams, oral exam	A1

### 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)	-	-	-	45	0	1.5
Exercises (E)	-	-	-	15	0	0.5



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1 <sup>st</sup> partial exam (physical quantities, measuring units, precision calculus)	33.3 %	75-79%	Sufficient (2)	0	20	0.5
		80-89%	Good (3)			
		90-94%	Very good (4)			
		95-100%	Excellent (5)			
2 <sup>nd</sup> partial exam (Chemical calculus - Stoichiometry)	33.3 %	50-59%	Sufficient (2)	0	40	1,5
		60-79%	Good (3)			
		80-89%	Very good (4)			
		90-100%	Excellent (5)			
3 <sup>rd</sup> partial exam (physical, inorganic and organic chemistry)	33.3 %	50-59%	Sufficient (2)	0	90	2
		60-79%	Good (3)			
		80-89%	Very good (4)			
		90-100%	Excellent (5)			
<b>TOTAL</b>	<b>100 %</b>			<b>60</b>	<b>150</b>	<b>6</b>

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
Final exam* (FE)		50-59% 60-79% 80-89% 90-100%	Sufficient (2) Good (3) Very good (4) Excellent (5)	0	90	3
<b>TOTAL</b>	<b>100 %</b>			<b>60</b>	<b>150</b>	<b>6</b>

\* The students who do not pass the partial exams during the semester are admitted to the exam in a regular or extraordinary exam period. In such a case, the examination consists of a written and oral part, and both parties participate equally in the final assessment.

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

Evaluation elements	Description	Deadline	Compensation
Attendance of lectures and	The attendance is regularly checked and recorded. A student may justifiably be absent with a maximum of	semester (60 hours of	-





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exercises	15% of direct teaching hours.	direct lecturer)	
1 <sup>st</sup> partial exam	Partial exam refers to the material processed in the first five lessons. It consists of so-called theoretical and computational tasks.	6 <sup>th</sup> week	Students who pass the 1 <sup>st</sup> partial exam can access the 2 <sup>nd</sup> partial exam.
2 <sup>nd</sup> partial exam	The partial exam refers to the material processed from the 6 <sup>th</sup> to the 10 <sup>th</sup> teaching term.	11 <sup>th</sup> week	Students who pass the 2 <sup>nd</sup> partial exam can access the 3 <sup>rd</sup> partial exam.
3 <sup>rd</sup> partial exam	The partial exam refers to the material processed from the 11 <sup>th</sup> to the 14 <sup>th</sup> teaching term.	15 <sup>th</sup> week	Students who pass the 3 <sup>rd</sup> partial exam are eligible for a final grade of Chemistry with Biochemistry.
Written exam	Written exams are attended by students who have a duly attended and certified semester but have not passed the three partial exams.	Exam terms	-
Oral exam	Students who passed a written exam are invited to the oral exam. The results of the written and oral exams equally participate in the final evaluation of Chemistry with Biochemistry.		-



## Mathematics

### Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
Interpretation of basic notions and facts of sets and functions when solving mathematical problems (graphs of elementary functions, sequence limits, domain of a function, properties of functions, composition of functions, inverse functions, function limits, function continuity).	participating in class problems, solving problems, independently solved homework, midterm and final exam, exam	A1
Applications of derivatives (tangents, elementary and compound function derivatives, derivative rules, function growth and decay, extremes of functions, graphs).	participating in class problems, solving problems, independently solved homework, midterm and final exam, exam	A1
Interpretation of two variable functions (partial derivatives, extremes).	participating in class problems, solving problems, independently solved homework, midterm and final exam, exam	A1
Interpretation of indefinite integrals (concept of primitive function and indefinite integral, integrating, basic properties of indefinite integrals, integration methods).	participating in class problems, solving problems, independently solved homework, midterm and final exam, exam	A1
Analysis of definite integrals (basic concepts, Newton-Leibnitz formula, calculating areas of plane figures using definite integrals, calculating the volume of a solid of revolution, centroid coordinates, double integral, first order differential equations).	participating in class problems, solving problems, independently solved homework, midterm and final exam, exam	A1
Interpretation of vectors and matrices (vectors in two- and three-dimensional space, operations with vectors, matrices and matrix calculus, determinants).	participating in class problems, solving problems, independently solved homework, midterm and final exam, exam	A1

### 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)	-			45	30	2.5
Exercises (E)	-			43	32	2.5
Partial exam	50%	50-59%	Sufficient (2)	1	29	1



1 (PE1)		60-74%	Good (3)			
		75-89%	Very good (4)			
		90-100%	Excellent (5)			
Partial exam 2 (PE2)	50%	50-59%	Sufficient (2)	1	29	1
		60-74%	Good (3)			
		75-89%	Very good (4)			
		90-100%	Excellent (5)			
<b>TOTAL</b>	<b>100%</b>	<b>PE1+PE2</b>		<b>90</b>	<b>120</b>	<b>7</b>

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
Final exam* (FE)	100%	50-59%	Sufficient (2)			2
		60-74%	Good (3)			
		75-89%	Very good (4)			
		90-100%	Excellent (5)			
<b>TOTAL</b>	<b>100%</b>	<b>FE</b>				

\* Students who fail to pass the partial exams, but have acquired at least 10% of the total score on those exams, can take the final exam which makes up 100% of the grade. The exam consists of a written and an oral part, and students who achieve at least 50% on the written part can take the oral part of the exam.

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

Evaluation elements	Description	Deadline	Compensation
Attendance of lectures and exercise	Attendance is checked during class. A student can miss a maximum of 15% of lectures and 15% of exercises. Students are required to fulfill mandatory homework assignments published via Merlin every week regularly and within the given deadline.	semester (90 hours of direct lectures)	-
Partial exam 1	Students solve problems from the coursework of the first part of the semester. The exam is in written form. A minimum of 10% of the score on the first partial exam is necessary for obtaining the lecturer's signature and taking the second partial exam and further exams.	8th week	Under extraordinary circumstances and with a valid excuse, the student can take the exam at a later date.



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Partial exam 2	Students solve problems from the coursework of the second part of the semester. The exam is in written form. A minimum of 10% of the score on the partial exam is necessary for obtaining the lecturer's signature and taking further exams.	15th week	Under extraordinary circumstances and with a valid excuse, the student can take the exam at a later date.
Written exam	The exam includes coursework from the entire semester. Students who obtained the lecturer's signature can take the exam.	Exam terms	
Oral exam	The exam includes coursework from the entire semester. Students who passed the written exam can take the oral exam. The final grade is obtained by combining the results of the written and oral exams.	Exam terms	



## Petrology with geology

### Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
Students will be able to describe the Earth's interior and the methods of investigation of the Earth's interior. They will be able to recognize the relation between endogenous and exogenous factors that are operating in the Earth's interior and exterior such as thermal convection in the upper mantle and rise of mountains. Students will be able to explain causes of plate tectonics.	Practical part of the exercises, partial exam, final exam	A1
Students will be able to describe elements of mineral crystals and their lattice, and crystal differences between groups of silicate minerals. They will be able to describe different physical properties of minerals and recognize specific physical properties by testing the minerals	Practical part of the exercises, partial exam, final exam	A1
Students will be able to describe the genesis of igneous rocks, differentiate igneous rocks based of their place of formation and structure	Practical part of the exercises, partial exam, final exam	A1, B3
Students will be able to classify igneous rocks based on the mineral and chemical composition. Students will be able to specify the minerals that are occurring in the composition of different igneous rocks.	Practical part of the exercises, partial exam, final exam	A1, B3
Students will be able to adduce the conditions of sedimentary rock formation. They will be able to recognize and explain the basic characteristics of sedimentary rocks (layer, bedding, bed surfaces) and classify the sedimentary rocks in elementary groups. They will be able to name and classify sedimentary rocks.	Practical part of the exercises, partial exam, final exam	A1, B3
Students will be able to define structural and mineral changes in the processes of formation of metamorphic rocks. They will be able to name the metamorphic rocks representing different type of metamorphism. Students will be able to differentiate metamorphic rocks from other rock types.	Practical part of the exercises, partial exam, final exam	A1
Students will understand the methods and basic principles used in stratigraphic classification systems, which describe the relative and absolute ages of geological events, processes and formations.	Practical part of the exercises, partial exam, final exam	A1



Student will be able to understand and use the information shown on the geological maps, profiles and columns.	Practical part of the exercises, partial exam, final exam	A1
Students will be able to recognize and describe the basic features of primary and secondary geological structures in the rocks of the Earth's crust. Students will be able to understand and use the professional terminology used in structural geology for classification and description of primary and secondary geological structures in the rocks of the Earth's crust. Students will be able to recognize, understand and use the information about primary and secondary geological structures gathered from the conducted field measurements as well as those shown on the geological maps and profiles.	Practical part of the exercises, partial exam, final exam	A1, B8
Students will be able to independently construct the geological profile based on the data from the geological map	Practical part of the exercises, partial exam, final exam	A1
Students will be able to understand the impact of surface and groundwater on the mechanical and chemical weathering of minerals and rocks, formation of relief and morphological shapes in plain, mountain and karst areas.	Practical part of the exercises, partial exam, final exam	B7
Students will be able to understand the natural hydrodynamic processes in the hydrological cycle and understand/use professional terminology used in hydrology and hydrogeology when describing the hydrological cycle, mode of water drainage on the surface as well as underground. Students will be able to understand and use the professional terminology used in hydrogeology for classification of groundwater in rocks with intergranular and fractural porosity, in classification of wellsprings, aquifers and their protection.	Practical part of the exercises, partial exam, final exam	B7
Students will be able to understand the mechanisms of earthquake occurrences, intensity, distribution and frequency in geodynamical different areas of the Earth's crust.	Practical part of the exercises, partial exam, final exam	A1
Students will be able to understand the reasons and factors influencing slope stability and understand and use the professional terminology used in engineering geology for classification of landslides and rockslides and soils.	Practical part of the exercises, partial exam, final exam	B3, B7, B8

### Methods of grading

Evaluation elements	Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students workload outside the direct	ECTS
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					<b>teaching</b>	
Lectures (L)	20%	-		30	15	1,5
Exercise €	10			8	15	0,5
Partial exam 1 – Earth's interior, minerals, physical properties of minerals and igneous rocks (genesis, classification)	20%	50-62%	Sufficient (2)	1	25	0,5
		63-75%	Good (3)			
		76-89%	Very good (4)			
		90-100%	Excellent (5)			
Partial exam 2 – Sedimentary and metamorphic rocks	20%	50-62%	Sufficient (2)	1	25	0,5
		63-75%	Good (3)			
		76-89%	Very good (4)			
		90-100%	Excellent (5)			
Partial exam 3 – Geology, geological structures, hydrology and hydrogeology	20%	60-70%	Sufficient (2)	1	25	0,5
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
Construction of the geological profile	10%			4	15	0,5
<b>TOTAL</b>	<b>100%</b>	<b>(Lxy0+Exy0 + PExy0)/100</b>		45	120	4

<b>Evaluation elements</b>	<b>Maximum points or Share in evaluation</b>	<b>Grade rating scale</b>	<b>Grade</b>	<b>Direct teaching hours</b>	<b>Number of average students workload outside the direct teaching</b>	<b>ECTS</b>
Final exam (FE)	100 %	60-70%	Sufficient (2)	2	60	2
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
<b>TOTAL</b>	<b>100%</b>	<b>(FExy0+Exy0)/100</b>				



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

<b>Evaluation elements</b>	<b>Description</b>	<b>Deadline</b>	<b>Compensation</b>
Attendance of lectures and exercise	Attendance of the course is conducted in the beginning of the lectures. Students can be excused from 20% of the total lecture hours.	semester (45 hours of direct lecturer)	-
Attendance of exercise	Exercises are conducted in groups. Each exercise term s practical where students are acquainted first the minerals and rocks, and afterwards with geological structures and a geological map. During the construction of the program (geological profile) students are following the steps and at the end of each term an examination is carried out. In the last term of the exercises students are delivering the correctly constructed program and are getting the signature as a part of the obligation for getting the grade.		In case of any need compensation is planned according to the plan of the course.
Partial exam 1	All students can approach the partial exam. It has 25 points and is graded according to the percentages.	6. week	
Partial exam 2	All students can approach the partial exam. It has 13 points and is graded according to the percentages.	9. week	
Partial exam 2	All students can approach the partial exam. It has 60 points and is graded according to the percentages.	14. week	There is a possibility of a correction of one of the partial exams.
Written exam	Students who did not get the grade through partial exams are approaching the written exam. The exam is composed of the whole course material and has a total of 100 points, 60 of which are for a positive grade.	Exam terms	-
Oral exam	Only students that are participating in the commissioned exam are being tested via oral exam.		-





## Forest Botany – Plant Morphology

### Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
To present the plant cell structure and function and plant function and plant histology (cytology, cytoplasm, plastids, mitochondria, cell wall, pits, cell nucleus, chromosomes, DNA, mitosis, meiosis, primary, secondary meristems, phellogen, vascular cambium, permanent or final cells, dermal and vascular tissue).	Exercises, Preliminary exam, Final exam	B1
To interpret the anatomy of vegetative plant organs (leaf, stem structure, structure of Gymno- and Angiosperms, bark anatomy, root anatomy, phylogeny of stele).	Exercises, Preliminary exam, Final exam	B1
To interpret the morphology of vegetative organs (structure, types, transformations and growth of stems, roots and leaves).	Exercises, Preliminary exam, Final exam	B1
Interpret the morphology of reproductive organs (structure and classification of flowers, inflorescences, fruits and seeds) and explain the alternation of generations and plant reproduction.	Exercises, Preliminary exam, 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
Exercises (E)	20%	Partly messy and incomprehensible, with major corrections	Sufficient (2)	30	0	1.0
		Orderly, legible, with major corrections	Good (3)			
		Orderly, legible, with minor corrections	Very good (4)			
		Orderly, legible, correct	Excellent (5)			



Partial exam I (PE1)	30%	60-70%	Sufficient (2)	-	15	0.5
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
Partial exam II (PE2)	50%	60-70%	Sufficient (2)	-	30	1.0
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
<b>TOTAL</b>	<b>100%</b>	<b>(E*20+PE1*30+PE2*50)/100</b>		45	45	3

Evaluation elements	Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students workload outside the direct teaching	ECTS
Final exam* (FE)	80%	60-70%	sufficient (2)	0	45	1,5
		71-80%	good (3)			
		81-90%	very good (4)			
		91-100%	excellent (5)			
<b>TOTAL</b>	<b>100%</b>	<b>(ZIx100)/100</b>				
* students who do not pass the midterm exams during the semester shall take the final exam. Ocjena se formira po formuli (E*20+FE*80)/100						

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

Evaluation elements	Description	Deadline	Compensation
Attendance of lectures	The attendance of students is checked and recorded at the lectures. The student can justifiably be absent with a maximum of 20% of lectures	semester (15 hours of direct lectures)	
Makeing exercises	The student can justifiably be absent with a maximum of 10% of the exercises. Exercises are attended in groups.	semester (30 hours of direct	Exceptionally, in the case of a



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	On the web site students can see the template of the folder and worksheet which they are required to prepare and have on the exercises. Students are required to have necessary lab equipment. Before each exercise, students are required to study the template script about this exercise. Evaluated are accuracy, regularity and active participation in the exercises.	lectures)	justified reason, the student compensates the absence of the individual exercise
Partial exam I	Partial exam is written and consists of the topics in Citology and Histology.	7 <sup>th</sup> week	
Partial exam II	Partial exam can be accessed by students who have passed the Partial exam I (PE1). and have positively evaluated exercises. The partial exam consists of a written and oral part and consists of the topics in Morphology.	15 <sup>th</sup> week	
Final exam	Final exam can be accessed by students who have not passed the Partial exams (PE1, PE2) and who have positively evaluated exercises. The partial exam consists of a written and oral part.	in accordance to the exam schedule	



## Zoology in Forestry

### Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
Interpret animal promorphology (importance and meaning of zoology, differences between plants and animals, the division of zoology, the size and form of animals, the plan of animal bodies (promorphology), the position of animals in space and time (ecological, geographic, geological), trophic chains).	Colloquium, written and oral exams	B2, B3, B8
Describe the Systematics of the Animalia Kingdom (animal phylogeny, heredity and evolution, animal taxonomy, Kingdom Monera, Kingdom Protocist, Animalia Animalia, Speciation, Insulation Mechanisms, biological community and ecosystems).	Colloquium, written and oral exams	B2, B3, B8
Interpret the integumentary, skeletal, muscular and nervous system in animals.	Colloquium, written and oral exams	B2, B3, B8
Interpret the sensory, digestive and respiratory systems in animals.	Colloquium, written and oral exams	B3, B8
Interpret the excretory, hormonal, excretory and reproductive system of organs in animals (forms of sexual and non-sexual reproduction, gender determinations, generation changes, heterogenesis).	Colloquium, written and oral exams	B3, B8
Describe the behavior of animals (osmoregulation of animals on land, bioluminescence, migration, raising of offspring).	Colloquium, written and oral exams	B3, B8

### 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
Lecture	-	-	-	30	-	1,0
Exercise	-	-	-	30	30	1,0
Fieldwork	-	-	-	8	8	0,5
Colloquium exam 1.	25%	60-74%	dovoljan (2)	-	20	0,87
		75-84%	dobar (3)			
		85-94%	vrlo dobar(4)			
		95-100%	izvrstan (5)			
Colloquium exam 2.	25%	60-74%	dovoljan (2)	-	20	0,87
		75-84%	dobar (3)			



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		85-94%	vrlo dobar(4)			
		95-100%	izvrstan (5)			
Colloquium exam 3.	25%	60-74%	dovoljan (2)	-	20	0,87
		75-84%	doobar (3)			
		85-94%	vrlo dobar(4)			
		95-100%	izvrstan (5)			
		60-74%	dovoljan (2)			
Colloquium exam 4.	25%	75-84%	doobar (3)	-	20	0,87
		85-94%	vrlo dobar(4)			
		95-100%	izvrstan (5)			
		60-74%	dovoljan (2)			
<b>TOTAL</b>	<b>100%</b>	-		68	118	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
Final exam (FE)	100 %	60-70%	Sufficient (2)		90	3
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
<b>TOTAL</b>	<b>100%</b>					
<b>*students who do not successfully pass colloquium exams, i.e. partial exams during the semester, are required to take the final exam (FE), where the grade from the final exam makes up 100% of the total grade</b>						

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

Evaluation elements	Description	Deadline	Compensation
Attendance of lectures	The student attendance is checked and recorded. Student absence of max 15% of lectures is allowed.	semester (30 hours of direct lecturer)	-
Attendance of exercises	The student attendance is checked and recorded. Student absence of max 15% of lectures is allowed.	semester (30 hours of direct lecturer)	-
Attendance of fieldwork	The student attendance is checked and recorded. Student absence of max 15% of lectures is allowed.	semester (8 hours of direct lecturer)	-
Colloquium exams	Colloquium exam is evaluated and participate in the final assessment of the subject	Four times during the semestar	Students who pass the colloquium exams don't have to take the final exam
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	-



## Anatomical structure of wood

### Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
Describe and recognize (sketch) position and role of wood cells, wood tissues and phloem cells and tissues in living tree (botanical connection)	Exercises in practicum, colloquium and exam	B1
Describe and recognize the role of wood anatomy in fundamental wood properties (technical connection)	Exercises in practicum, colloquium and exam	B1
Determine (recognize) domestic commercial types of wood using determination key(s)	Exercises in practicum, colloquium and 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	-	-	-	30	15	1.5
Exercises (E)	10%	Mostly inaccurate, with major corrections	Sufficient (2)	28	5	0.5
		Mostly accurate, with corrections	Good (3)			
		Exact, with minor corrections	Very good (4)			
		Accurate and error-free	Excellent (5)			
Macroscopic Wood Identification Colloquium (C)	15%	Constant help of the examiner	Sufficient (2)	1	5	0.5
		Partial help of the examiner	Good (3)			
		minor help of the examiner	Very good (4)			
		without any help of the examiner	Excellent (5)			
Exam (E <sub>x</sub> )	75%	60-70%	Sufficient (2)	1	15	0.5



		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
<b>UKUPNO</b>	<b>100%</b>	<b>(Ex10 + Cx15 + Exx75)/100</b>		60	40	3

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

<b>Evaluation elements</b>	<b>Description</b>	<b>Deadline</b>	<b>Compensation</b>
Lectures	The attendance is checked and recorded.	Semester (30 hours od direct teaching)	-
Exercises (E)	Exercises are attended by groups. There are 7 practical exercises of microscopic and macroscopic recognition of wood. The accuracy, tidiness and regularity of performance are evaluated.	Semester (30 hours of exercises)	Exceptionally, in the case of a justified reason
Macroscopic Wood Identification Colloquia (C)	It consists of determination of 6 types of coniferous and dicotyledonous woods with the aid of magnifiers. The colloquium is evaluated and participates in the final evaluation of the subject.	15. week	Colloquia can be taken three times in one academic year
Exam (P)	The exam can be attended by students whose exercises and colloquia were evaluated positively. The written exam is evaluated and participates in the final grade of the subject. The final grade of the course is obtained according to the formula <b>Ex10 + Cx15 + Exx75)/100</b>	Exam terms	-



## Physical and health education 1

### Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
Describe the structure of the physical exercise class.	exercises, correction and evaluation exercises	D1
Explanation of the impact of physical exercise on health.	exercises, correction and evaluation exercises	D1
Choose fitness exercises designed to strengthen individual muscle groups.	exercises, correction and demonstration	D1
Demonstrate specific exercises with regard to kinesiologic activity.	exercises, structural analysis, assistance, correction and evaluation exercises	D1
Organize constructive free time	Exercises and evaluation exercises	D1
Assess personal diet and physical exercise habits.	exercise, diet diary correction and evaluation exercises	D1
Demonstrate general preparatory exercises and stretching exercises.	exercises, description, demonstration, correction	D1
Understanding kinesiology programs and their target orientation.	vježbe, korekcija i vrednovanje vježbi	D1
Control emotions and strengthen self-control.	Exercises, correction	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
Exercises (E)	100%	Mostly inaccurate, with major corrections	Sufficient (2)	30	0	1.0
		Mostly accurate, with corrections	Good (3)			
		Exact, with minor corrections	Very good (4)			
		Accurate and error-free	Excellent (5)			
<b>UKUPNO</b>	<b>100%</b>	<b>(Ex100)/100</b>		<b>30</b>	<b>0</b>	<b>1.0</b>





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

<b>Evaluation elements</b>	<b>Description</b>	<b>Deadline</b>	<b>Compensation</b>
Exercises (E)	Exercises are attended by groups. There are 7 practical exercises of microscopic and macroscopic recognition of wood. The accuracy, tidiness and regularity of performance are evaluated.	Semester (30 hours of exercises)	Exceptionally, in the case of a justified reason



## Forest Botany – Plant Systematics

### Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
1. To present the plant systematics and the systemic life division (systemic units (taxa), artificial and phylogenetic systems, plant evolution, speciation, hybridization, plant reproduction, general characteristics and division of Cormophyta).	Exercises, Preliminary exam, Final exam	B1
2. To explain the general characteristics, systematic division, morphology and ontogenetic development of Pteridophyta.	Exercises, Preliminary exam, Final exam	B1
3. To explain the general characteristics, systematic division, morphology and ontogenetic development of Gymnosperms.	Exercises, Preliminary exam, Final exam	B1
4. To explain the general characteristics, systematic division, morphology and ontogenetic development of Angiosperms (vegetative and reproductive plant organs, function, basic forms, plant organs transformations).	Exercises, Preliminary exam, Final exam	B1
5. To apply the principles and methods of plant identification using keys.	Exercises, Preliminary exam, Final exam	B1
6. Show the most important families and genera of the Croatian flora (diversity, taxonomic status, distribution, significance).	Exercises, Preliminary exam, 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)	-	-	-	30	0	0.5
Exercises (E)	10%	Partly messy and incomprehensible, with major corrections	Sufficient (2)	15	0	0.5
		Orderly, legible, with major corrections	Good (3)			
		Orderly, legible, with minor	Very good (4)			



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		corrections				
		Orderly, legible, correct	Excellent (5)			
Field work (FW)	-	-	-	32	-	0.5
Partial exam - plant identification (PE)	20%	60-70%	Sufficient (2)	-	20	1
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
Herbarium (H)	20%	Partly messy, some plants were poorly herbarized, with major corrections, minimum number of plants	Sufficient (2)	-	13	0.5
		Orderly, plants properly herbarized, with major corrections, minimum number of plants	Good (3)			
		Orderly, plants properly herbarized, with minor corrections, more than minimum number of plants	Very good (4)			
		Orderly, plants properly herbarized, correct, significantly more than minimum number of plants	Excellent (5)			
Final exam (FE)	50%	60-70%	Sufficient (2)	-	40	2
		71-80%	Good (3)			
		81-90%	Very good (4)			



		91-100%	Excellent (5)			
<b>TOTAL</b>	<b>100%</b>	<b>(E*10+H*20+PE*20+FE*50)/100</b>		77	73	5

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

<b>Evaluation elements</b>	<b>Description</b>	<b>Deadline</b>	<b>Compensation</b>
Attendance of lectures	The attendance of students is checked and recorded at the lectures. The student can justifiably be absent with a maximum of 20% of lectures	semester (30 hours of direct lectures)	
Making exercises+field works	The student can justifiably be absent with a maximum of 10% of the exercises. Field work must be done in 100% amount. Exercises are attended in groups. On the web site students can see the template of the folder and worksheet which they are required to prepare and have on the exercises. Students are required to have the lab equipment. Evaluated are accuracy, regularity and active participation in the exercises. Prior to field work, students are required to study the instructions about collecting and herbarizing plants that can be downloaded from the web site. For field work, they must prepare a field folder with papers for collecting plants according to the instructions listed on the web site.	semester (15+32 hours of direct lectures)	Exceptionally, in the case of a justified reason, the student compensates the absence of the individual exercise
Partial exam in plant identification	Students have to recognize plant species from photographs. The accuracy of the recognition and pronunciation of the Latin names of plants is evaluated. The Partial exam should be positively evaluated prior to taking the final exam.	in accordance to the agreed deadline	
Making herbarium collection	Students are obliged to make herbarium collection according to the instructions presented during lectures and field work and that are also listed on the web site. The template for the field folder and herbarium labels should be downloaded from the web site. The accuracy, the orderliness and the quality of the herbarium are evaluated. Herbarium should contain at least 150 plants systematically sorted by families. The herbarium collection should be reviewed and positively evaluated prior to taking the final exam	prior to takeing the final exam	
Final exam	Final exam can be accessed by students who have passed the partial exam in plant identification and have positively evaluated exercises and herbarium collection. The partial exam consists of a written and oral part.	in accordance to the agreed deadline and exam schedule	



## Biometrics

### Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
Explain types of variables: numeric (continuous and discrete) and categorical (dichotomous, ordinal i nominal); graphical presentation and frequency tables, classification of graphs according to data types: bar chart, histogram, frequency polygon, line chart, pie chart, scatterplot, stem-and-leaf plot, Box-Whisker plot; relative frequencies, cumulative absolute and cumulative relative frequencies, calculation and analysis	2 partial exams, Written and oral final exam	A1
Describe measures of central tendency and measures of position (arithmetic mean, geometric mean, harmonic mean, quadratic mean, minimum, maximum, median, lower and upper quartile, mode)	2 partial exams, Written and oral final exam	A1
Explain measures of variation (data range, interquartile range, standard deviation, variance, coefficient of variation)	2 partial exams, Written and oral final exam	A1
Interpret theoretical distributions or models of population distributions (normal Gaussian distribution, Student's t-distribution, binomial distribution, chi-square distribution, F-distribution, definition of density function and distribution function, calculating probability (area) under the density function for normal and t-distribution, calculating probability for binomial distribution, normal approximation to the binomial distribution)	2 partial exams, Written and oral final exam	A1
Explain point estimates of arithmetic mean, variance and proportion (central limit theorem, sampling distribution, standard error) Distinguish population parameters from their sample estimates; estimate population arithmetic mean (expected value), variance and proportion based on the sample	2 partial exams, Written and oral final exam	A1
Present hypothesis testing of arithmetic mean and proportion (rules and procedure of testing, type I ( $\alpha$ ) and type II ( $\beta$ ) errors, power of the test ( $1 - \beta$ ), testing (assumed constant) arithmetic mean and proportion of population	2 partial exams, Written and oral final exam	A1
Present interval estimates of expected value and proportion, testing of proportion, variances (F-test) and arithmetic mean (Student t-test) from two independent samples and testing difference of arithmetic means from two dependent samples (paired t-test)	2 partial exams, Written and oral final exam	A1
Present analysis of observed and expected frequencies for categorical variable using chi-square test	2 partial exams, Written and oral final exam	A1
Describe correlation analysis and calculate linear correlation coefficient for two continuous variables	2 partial exams, Written and oral final exam	A1



### 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	15	1.5
Exercises (E)				30	45	2.5
2 Partial exams (PE)	100%	65-74	Sufficient (2)	4	26	1
		75-84	Good (3)			
		85-94	Very good (4)			
		95-100	Excellent (5)			
Final exam (FE)	100%	60-70	Sufficient (2)	3	-	5
		71-80	Good (3)			
		81-90	Very good (4)			
		91-100	Excellent (5)			

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

Evaluation elements	Description	Deadline	Compensation
Attendance of lectures and exercises	Attendance is checked for all students during the semester. Each student is allowed to be absent up to 4 hours of lectures and 4 hours of exercises.	End of semester	-
Partial exam	Two partial exams are carried out, each with 5 assignments and resulting maximum 100 (2*50) points. Minimum 65 points (20 points per exam) can substitute the final exam.	During semester	-
Written exam	Students that meet attendance criteria can access to the written exam. Written part consists of 5 assignments making maximum total 100 points.	Exam terms	-
Oral exam	Students that pass written part can access the oral exam.	Exam terms	-



## Soil Science

### Type of course:

### Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
Compare the role of soil and pedosphere. Identify the global significance of soil. Interpreted the specificity of forest soil.	partial examination, laboratory exercises, full examination	D1
Group primary soil minerals and compare their properties. Group the most usually rocks and compare their properties that are most important to soil properties. Explain to weathering of minerals and rocks. Explain the properties of rocks and minerals.	partial examination, laboratory exercises, full examination	D1
Enumerate and classify the most important soil organisms. Describe the accumulation of organic residues - quantity and quality. Describe the method of degradation of organic residues and the formation of humus. Describe composition and properties of humus. Analyze a soil humus acidity and character of humus	partial examination, laboratory exercises, full examination	A3, B4, B8, D1
Describe biological circulating of matter and role of soil. Identify specific cycles of some biogenic elements. Explain the principles of soil sorption. Explain the composition and role of the colloidal complex of soil. Analyze the sorption characteristics of soil.	partial examination, laboratory exercises, full examination	A3, B4, B8, D1
Explain the solid soil phase composition. Enumerate and distinguish the properties of mechanical particles of soil. Particle size distribution and soil structure Enumerate and distinguish the properties of shapes and elements of the soil structure. Soil porosity and soil densities. Enumerate and explain the soil consistency indicators.	partial examination, laboratory exercises, full examination	A3, B4, B8
Natural dynamic water in soil. Describe water forms in soil. Analyze the soil water constants. Explain quantity and quality of soil air.	partial examination, laboratory exercises, full examination	A3, B4, B8



Analyze soil air capacity. Explain thermal properties of soil. Explain chemical properties of soil solution. Analyze and interpret soil reaction. Explain the significance and nature of the redox potential of the soil. Describe the dynamics of biogenic elements in the soil solution.			
Soil-forming factors. Identify the nature of some soil-forming factors in Croatia. Enumerate and explain some soil-forming processes. Identify the role of soil-forming factors and processes on a specific soil profile.	partial examination, laboratory exercises, full examination	B4, B8	
Soil horizons. Explain the properties of some soil horizons. Soil classification system. Enumerate the sections, classes and types of soil. Explain the basic characteristics of the most important soils at the class level and type of soil. Classify soil according to taxonomic affiliation.	partial examination, laboratory exercises, full examination	A3, B4, B8, D1	
Plan, ways and purpose of soil sampling. Representative soil samples. Describe the types of soil samples. Describe sampling and mark of soil samples. Enumerate and describe field observations of soil parameters.	partial examination, laboratory exercises, full examination	A3, B4, B8, 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	30	2
Laboratory Exercises (LE)	10 %	Partly disordered and incomprehensible, with major corrections and on time	Sufficient (2)	30	30	2
		Clean, easy, with bigger corrections and on time	Good (3)			





		Clean, easy, with minor corrections and on time; commitment to exercises	Very good (4)			
		Clean, easy, accurate and timely; an emphasis on exercises	Excellent (5)			
Field courses (FC)				24	6	1
Exam (E)	90 %	50-60 %	Sufficient (2)	4	86	3
		61-75 %	Good (3)			
		76-90 %	Very good (4)			
		91-100%	Excellent (5)			
<b>TOTAL</b>	<b>100%</b>	<b>(LEx10+Ex90)/100</b>		88	152	8

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

<b>Evaluation elements</b>	<b>Description</b>	<b>Deadline</b>	<b>Compensation</b>
Lectures (L)	On the lectures is checked the students presence. The student can justifiably be absent with up to 30% of teaching hours (5 lectures).	Semester (30 hours of direct teaching)	-
Laboratory Exercises (LE)	Exercises are attended by groups. 18 practical exercises are performed. At the beginning of the exercise, students receive a report template. The accuracy, regularity and the engagement in the exercises are evaluated.	According syllabus and agreement with the students	In the case of a justified reason, the student draws up absence from the particular exercise term
Field courses (FC)	Field work is performed in groups during the second half of the semester, and the terms are published at the beginning of the semester.	Second half of the semester.	-
Partial exam (PE)	Students can take the exam in two parts (partial). The first part takes place after ~ 60% of theoretical teaching, and the term is agreed with the students. The exam consists of a written and oral part (the written part of the exam must be passed for oral instruction), and it is about 60% of the subjects provided by the theoretical program. Partial exams can be accessed by students who have no more than one absence from the lectures. Those	Agreement with the students in second half of the semester.	-



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	<p>students who take the first partial exam will also take the second part of the exam on some of the regular test terms by the end of the current academic year. The arithmetic mean of the two grades represents the grade of the exam that) gives the final grade.</p>		
Full exam (FE)	<p>Students who have fulfilled their obligations in relation to lectures, exercises and field courses can access the regular exam. Examination of the entire program (realized through theoretical lectures, exercises and field courses) is examined on the exam. Students on exam (pre-printed questions) fit the questions asked in the form of rounding and written answers. A written exam is a condition for access to an oral exam, when gets a final grade.</p>	Published test deadlines.	-



## Ground surveying with basics of cartography

### Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
Pronounce the definition of remote sensing Describe the historical development of remote sensing. Compare digital and analog photography. Explain ways of stereoscopic observation.	Performing exercises in a practicum, midterm exam, comprehensive exam	D1
Identify the basic principles of remote sensing and their physical and technological basics. Explain and describe parts of the electromagnetic spectrum. List reflection and emission properties of natural objects. Describe the spectral characteristics of objects on Earth surface.	comprehensive exam	A3, B5, B8, D1
Indicate and explain the recording systems within remote sensing. List the types and characteristics of photography Describe procedures of aerial survey. Explain what type of errors occur in aerial surveying. Describe and demonstrate the preparation of images for measuring and orientation procedure of the aerial photographs. Perform visual, measurement and digital photo interpretation on aerial photographs. Specify the application of aerial photographs for forestry purposes.	Performing exercises in a practicum, midterm exam, comprehensive exam	A3, B5, B8, D1
Specify the types of satellites and their classification according to purpose and orbit. Explain ways of interpretation of satellite images. Carry out a visual interpretation of satellite imagery. Show and explain the procedure of digital interpretation of satellite image (supervised and unsupervised classification). Specify the application of satellite images in forestry.	Performing exercises in a practicum, midterm exam, comprehensive exam	A3, B5, B8, D1
Pronounce the definition of the geographic information system (GIS). Specify a historical overview of GIS development. Explain the GIS organization.	comprehensive exam	D1
Show the establishment of a database in GIS. Apply different forms of data for displaying objects. Carry out linking of the attribute database with geometric data.	Performing exercises in a practicum, midterm exam, comprehensive exam	A3, B5, B8, D1
Explain the difference and the basic features of raster and vector GIS. Compare and describe the analysis of vector and raster data. Create thematic maps based on the interpretation of the images. Explain the application of RS and GIS in forestry.	Performing exercises in a practicum, midterm exam, comprehensive exam	A3, B5, B8, 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	0.75
Exercises (E)	-			30	15	1.5
Field work (FW)	-			16	14	1
Midterm exam (ME)	25%	60-70%	Sufficient (2)		30	0.75
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
Comprehensive exam (CE)	75%	60-70%	Sufficient (2)	10	35	1.25
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
<b>TOTAL</b>	<b>100%</b>	<b>(PEx25 + CEx75)/100</b>		<b>86</b>	<b>94</b>	<b>5</b>

### Detailed description of evaluation elements for lecturer, 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 (E)	Exercises are attended in groups. Each student is doing individual tasks. The first part of the exercise is related to remote sensing (exercises in practicum), and the second part on the geographic information systems (exercises on computers in computer classroom). The accuracy, precision, regularity, and engagement on the exercises are evaluated. 2 absences from exercises are allowed with the	In accordance with the syllabus and agreed terms directly with the students.	The student work off for absence from the individual exercise term



	additional preparation of the seminar work.		
Field work (FW)	Field teaching is performed in groups at the end of the semester, and the dates are published at the beginning of the semester. Attending of field teaching is a prerequisite for passing exams.	January	-
Partial exam	A compulsory two midterm exams is laid within the course. The first midterm exam is held after 50% of theoretical teaching and exercises. The term is arranged with students. The midterm exam can be accessed by students who have submitted accurate individual tasks. Those students who hold the first midterm exam will get the right to go to the second exam, with the condition of submitted and accurate remaining tasks, and the programs from the field teaching. The second midterm exam is held at the end of the semester and before the start of deadlines exams. Two passed a midterm exam is a condition for students to get a signature and go to the 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, exercises and field teaching and passed two midterm exams are eligible to attend a regular exam period. On exam checks knowledge of the entire program (implemented through theoretical lectures, exercises and field teaching). A passed midterm examination is a requirement for an oral exam, and grade of two midterm examinations is part of the final grade.	Published examination deadlines	-



## Physiology of forest trees

### Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
To explain the relationship between water and plants (water potential, plant water uptake and conductivity, root pressure, water extraction, transpiration, embolism of the tree conducting system, plant water status).	Exercises, Preliminary exam	B1
To explain plant metabolism and mineral nutrition (the structure and activity of enzymes in plant cells, the physiological role of mineral substances in the plant, the assimilation of mineral substances and the role of mycorrhiza).	Exercises, Preliminary exam	B1
To interpret photosynthesis and breathing (chemoautotrophy, photoautotrophy, the structure of photosynthetic apparatus, photosynthetic reactions, photorespiration, photosynthesis types, influence of environmental factors, aerobic and anaerobic cellular respiration, whole-plant breathing, the regulation of cellular metabolism).	Preliminary exam, knowledge test, final exam	B1
To present physiological processes of plant growth and differentiation in relation to key environmental factors (plant hormones, auxins, gibberellins, cytokinins, abscisic acid, bud, seed and embryo dormancy, phytochromes, photomorphogenesis).	Preliminary exam, knowledge test, final exam	B6, B7
To analyze the physiological processes involved in the fruiting of forest trees (the control of flowering, development of male and female gametophytes, fertilization).	Preliminary exam, knowledge test, final exam	B6
To interpret the physiology of stress (resistance of woody plants to low and high temperatures, droughts, water, soil and air pollution with diseases).	Preliminary exam, knowledge test, final exam	B6, B7
To explain the physiology of motion (passive movements, organ movements, free locomotor movements, motion in the cell, physical movements).	Preliminary exam, knowledge test, 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)	-	-	-	30	0	1
Exercises (E)	-	-	-	15	0	0.5
Partial exam - exercises (PEE)	30%	60-70%	Sufficient (2)		15	0.5
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
Partial exam (PE1)	35%	60-70%	Sufficient (2)		30	1
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
Partial exam (PE2)	35%	60-70%	Sufficient (2)		30	1
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
<b>TOTAL</b>	<b>100%</b>	<b>(PEE*30+PE1*35+PE2*35)/100</b>		<b>45</b>	<b>75</b>	<b>4</b>

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
Final exam (FE)	70%	60-70% 71-80% 81-90%	Sufficient (2) Good (3) Very good (4)		60	2



91-100% Excellent (5)

<b>TOTAL</b>	<b>100%</b>	<b>(FE*70+PEE*30)/100</b>
* students who do not pass through the partial exams have to access the final exam that makes 70% of the grade, and the remaining 30% of the grade make the exercise		

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

<b>Evaluation elements</b>	<b>Description</b>	<b>Deadline</b>	<b>Compensation</b>
Lectures + exercises	The attendance of students is checked and recorded at the lectures. Student may not be absent more than 20% of lectures and 10% of exercises. The exercises are attended in groups. Exercises are performed in the laboratory. Students have templates for each exercise	semester (45 hours of direct teaching)	Exceptionally, in the case of a justified reason, the student may compensate the absence of an individual exercise.
Partial exam - exercises (PEE)	After the exercises are done, the students are obliged to take the partial exam. The students answer the questions on previously printed exam.	in accordance to the agreed deadline	-
Partial exam (PE1)	The students answer the questions on previously printed exam. Students are not obligatory to access the 1st partial exam. If they do not access the partial exam, they have to take the final exam.	9th week	-
Partial exam (PE2)	The students answer the questions on previously printed exam. Students are not obligatory to access the 2nd partial exam. If they do not access the partial exam, they have to take the final exam. If the students have a positive grade in partial exams according to the formula <b>PEE<sub>x</sub>30 + PE1<sub>x</sub>35 + PE2<sub>x</sub>35</b> they are not required to access the final exam.	15th week	-
Final exam (FE)	Students who fail to pass the Partial exam are obligatory to attend the final exam. The final exam consists of a written and oral part. In a written part students answer the questions on previously printed exam. Students who pass a written exam are orally asked questions from different parts of the program content. The final grade of the subject is obtained according to the formula <b>FE<sub>x</sub>70 + PEE<sub>x</sub>30</b>	in accordance to the exam schedule	-





## Physical and health education 2

### Learning outcomes and evaluation methods

<b>Learning outcomes (LO)</b>	<b>Evaluation methods</b>	<b>Connection with the study program LO</b>
Describe the structure of the physical exercise class.	exercises, correction and evaluation exercises	D1
Explanation of the impact of physical exercise on health.	exercises, correction and evaluation exercises	D1
Choose fitness exercises designed to strengthen individual muscle groups.	exercises, correction and demonstration	D1
Demonstrate specific exercises with regard to kinesiologic activity.	exercises, structural analysis, assistance, correction and evaluation exercises	D1
Organize constructive free time	Exercises and evaluation exercises	D1
Assess personal diet and physical exercise habits.	exercise, diet diary correction and evaluation exercises	D1
Demonstrate general preparatory exercises and stretching exercises.	exercises, description, demonstration, correction	D1
Understanding kinesiology programs and their target orientation.	vježbe, korekcija i vrednovanje vježbi	D1
Control emotions and strengthen self-control.	Exercises, correction	D1



## Forest mensuration

### Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
List measured variables, precision and accuracy in measurement, and means of data presentation.	Inspection and evaluation of assignments, partial and final exams	B5, C1
Interpret measurement of tree diameter, perimeter and height (instruments, errors).	Field exercises, partial and final exams	B5, C1
Explain data collection on sample plot, stand and management unit (sample and sample size, types and sizes of sample plots, measurement on sample plots).	Field exercises, Inspection and evaluation of assignments, partial and final exams	A1, B5, C1, D1
Interpret a diameter distribution in even-aged and selection stands (change of diameter distribution due to harvest, importance of diameter distribution by tree species and diameter classes).	Inspection and evaluation of assignments, partial and final exams	A1, B5, C1, D1
Describe construction of height curves (height curve of even-aged and selection stands, shift of height curve in even-aged stands, methods of curve construction).	Inspection and evaluation of assignments, partial and final exams	A1, B5, C1
Interpret determination and calculation of volume (volume of felled and standing trees, sectional method, single-entry and double-entry volume tables, applicability of single-, double- and triple-entry volume tables for single trees and forest stands).	Inspection and evaluation of assignments, partial and final exams	B5, C1
Describe design of a sample and data collection methods for diameter increment.	Partial and final exams	B5, C1, 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)		-	-	45		1.5
Exercises (E)	20%	Significant corrections, on time	Sufficient (2)	30	30	2
		Medium corrections, on time	Good (3)			
		Minor corrections, on time	Very good (4)			
		No correction, on time	Excellent (5)			



Field work (FW)	-	-	-	16	-	0,5
Partial exam 1 (PE1)	40%	60-70%	Sufficient (2)		44	1.5
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
Partial exam 2 (PE2)	40%	60-70%	Sufficient (2)		44	1.5
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
<b>TOTAL</b>	<b>100%</b>	<b>(Ex20+PE1x40 + PE2x40)/100</b>		<b>91</b>	<b>118</b>	<b>7</b>

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
Final exam* (FE)	80 %	60-70%	Sufficient (2)		88	3
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
<b>TOTAL</b>	<b>100%</b>	<b>(FEx80+Ex20)/100</b>				

**\*Students that do not pass partial exams during the semester take the final exam – final grade consists of 80% from final exam and 20% from exercises**

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

Evaluation elements	Description	Deadline	Compensation
Attendance of lectures and exercises	Attendance is checked for all students during the semester. Each student is allowed to be absent up to 20% of lectures and 10% of exercises.	semester (75 hours of direct lecturer)	-
Field work	Attendance is checked and active participation is evaluated for all students. Field work is completely compulsory	Semester (16 hours)	In special cases of justified absence,



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		of direct teaching)	students can compensate field work by seminar paper and partial exam on field work issues
Exercise assignments (E)	Students are instructed (preparatory materials, templates) to make individual assignments on the matter that is covered by lectures and exercises. Accuracy, tidiness and timeliness are evaluated.	According to schedule	
Partial exam	Delivered and correct assignments dealing with subject matter are requirement for each partial exam. Each partial exam consists of 20 assignments, with minimum threshold 60%. Access to second partial exam is enabled to those who pass the first one, and have correct all assignments and seminar on field work. Students who pass both partial exams are exempt from final exam, and points from exercise assignments are added to make the final grade.	Middle and the end of a semester	
Written exam (WE)	Exam consists of 20 assignments, consisting of subject matter from lectures, exercises and field work. Minimum threshold is 60%.	Exam terms	
Oral exam (OE)	Requirement for oral exam is successfully fulfilled written exam at the same exam term. Theoretical knowledge and subject covered during teaching are tested. Final grade is calculated as follows: <b>(WEx40+OEx50+Ex10)/100</b>		



## Forestry phytocenology

### Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
Explain forest phytocenology and ecosystems (role and tasks, division and historical development of phytocenology, phytochenological directions and schools, biocenosis and natural and anthropogenic ecosystems).	Preliminary exam, final exam	B8
Forest vegetation synmorphology and synecology (quantitative and qualitative indicators, data collection, analytical processing and synthetic development, synmorphology (structure and composition) of plant communities, classification of synecological factors, relation of plant species and plant communities to the synecological factors of their adherence - soil, climatic, geomorphological and biotic factors)	Practical exercises, preliminary exam, final exam	A1, B4, B8
Syndynamics of forest vegetation (vegetation succession, syndynamics units, initial, transitional, permanent and climatic communities, practical importance).	Preliminary exam, final exam	A1, B4, B8
Present the synhorology of forest vegetation (definition and types of area of distribution of plant communities, floral geoelements and area, spatial distribution and zoning of vegetation, altitude and horizontal distribution, disorders and disturbance of vegetation).	Preliminary exam, final exam	D1
Explain systematics of forest vegetation (historical development, nomenclature rules, associations, higher and lower systematic units).	Preliminary exam, final exam	D1
Present the forms of forest vegetation, their development and their distribution in Croatia (forest vegetation, the most important forest communities).	Preliminary exam, final exam	B1, 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



Creating exercises and field work reports (E)	20%	Partly untidy and incomprehensible, with major corrections and on time	Sufficient (2)	30+24	40	3
		Neat, legibly, with bigger corrections and on time	Good (3)			
		Neat, legibly, with small corrections and on time	Very good (4)			
		Neat, legibly, correct and on time	Excellent (5)			
Partial exam (2)	80%	60-70%	Sufficient (2)	0	60	2
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
<b>TOTAL</b>	<b>100%</b>	<b>(Vx20 + Pex80)/100</b>		82,5	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
Final exam (FE)	80 %	60-70%	Sufficient (2)		60	2
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
<b>TOTAL</b>	<b>100%</b>	<b>(FEx80+Ex20)/100</b>				

\* Students who do not pass during the semester by a written partial exams, approach to final exam which accounts for 80% of the final grade, and the remaining 20% is grade from exercises

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

Evaluation elements	Description	Deadline	Compensation
Lectures + exercises + reports	The presence of students is being checked and noted. A student may justifiably be absent with a maximum of 15% of direct teaching hours.	semester (82,5 hours of direct lectures)	-
1. Partial exam	1st partial exam is available to students who have participated lectures, exercises and field work of the first	8. week	-



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	half of the semester. The students in the pre-printed exam answer the questions asked. The partial exam is evaluated and participates in the final evaluation of the subject, whereupon 60% of the points are to be collected for passing.		
2. Partial exam	2nd partial exam is available to students who have participated lectures, exercises and field work and passed the first partial exam. The students in the pre-printed exam answer the questions asked. The partial exam is evaluated and participates in the final evaluation of the subject. The two partial exams are scored with a total of 80 points, each with 40 points. A total of 48 points of 80 points (60%) have to be collected for passing.	15. week	
Written exam	The exam can attend students with realized exercises and field work. The students in the pre-printed exam answer the questions asked. The written exam is evaluated and participates in the final assessment of the subject, whereby it is necessary to collect 60% points for passing	Exam terms	-
Oral exam	Students who pass a written exam are being asked questions from different parts of the program content.	Exam terms	-



## Remote sensing and GIS in forestry

### Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
Pronounce the definition of remote sensing Describe the historical development of remote sensing. Compare digital and analog photography. Explain ways of stereoscopic observation.	Performing exercises in a practicum, midterm exam, comprehensive exam	D1
Identify the basic principles of remote sensing and their physical and technological basics. Explain and describe parts of the electromagnetic spectrum. List reflection and emission properties of natural objects. Describe the spectral characteristics of objects on Earth surface.	comprehensive exam	A3, B5, B8, D1
Indicate and explain the recording systems within remote sensing. List the types and characteristics of photography Describe procedures of aerial survey. Explain what type of errors occur in aerial surveying. Describe and demonstrate the preparation of images for measuring and orientation procedure of the aerial photographs. Perform visual, measurement and digital photo interpretation on aerial photographs. Specify the application of aerial photographs for forestry purposes.	Performing exercises in a practicum, midterm exam, comprehensive exam	A3, B5, B8, D1
Specify the types of satellites and their classification according to purpose and orbit. Explain ways of interpretation of satellite images. Carry out a visual interpretation of satellite imagery. Show and explain the procedure of digital interpretation of satellite image (supervised and unsupervised classification). Specify the application of satellite images in forestry.	Performing exercises in a practicum, midterm exam, comprehensive exam	A3, B5, B8, D1
Pronounce the definition of the geographic information system (GIS). Specify a historical overview of GIS development. Explain the GIS organization.	comprehensive exam	D1
Show the establishment of a database in GIS. Apply different forms of data for displaying objects. Carry out linking of the attribute database with geometric data.	Performing exercises in a practicum, midterm exam, comprehensive exam	A3, B5, B8, D1
Explain the difference and the basic features of raster and vector GIS. Compare and describe the analysis of vector and raster data. Create thematic maps based on the interpretation of the images. Explain the application of RS and GIS in forestry.	Performing exercises in a practicum, midterm exam, comprehensive exam	A3, B5, B8, 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	7,5	1.25
Field work (FW)	-			16	7,5	0.75
Midterm exam (ME)	25%	60-70%	Sufficient (2)		22,5	0.75
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
Comprehensive exam (CE)	75%	60-70%	Sufficient (2)	0	34,5	1.25
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
<b>TOTAL</b>	<b>100%</b>	<b>(PEx25 + CEx75)/100</b>		<b>76</b>	<b>72</b>	<b>5</b>

### Detailed description of evaluation elements for lecturer, 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 (E)	Exercises are attended in groups. Each student is doing individual tasks. The first part of the exercise is related to remote sensing (exercises in practicum), and the second part on the geographic information systems (exercises on computers in computer classroom). 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



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Field work (FW)	Field teaching is performed in groups at the end of the semester, and the dates are published at the beginning of the semester. Attending of field teaching is a prerequisite for passing exams.	January	-
Partial exam	A compulsory two midterm exams is laid within the course. The first midterm exam is held after 50% of theoretical teaching and exercises. The term is arranged with students. The midterm exam can be accessed by students who have submitted accurate individual tasks. Those students who hold the first midterm exam will get the right to go to the second exam, with the condition of submitted and accurate remaining tasks, and the programs from the field teaching. The second midterm exam is held at the end of the semester and before the start of deadlines exams. Two passed a midterm exam is a condition for students to get a signature and go to the 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, exercises and field teaching and passed two midterm exams are eligible to attend a regular exam period. On exam checks knowledge of the entire program (implemented through theoretical lectures, exercises and field teaching). A passed midterm examination is a requirement for an oral exam, and grade of two midterm examinations is part of the final grade.	Published examination deadlines	-



## Bases of hunting management

### Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
Describe the role and importance of hunting management through history, legal regulations in hunting (hunting and hunting development, the role of hunting management)	practice exercises, final exam	A1, C4, D1
Explain hunting zoology (game species, morphological and biological characteristics, protected animal species, bugs and horns, determining age and sex, assessing hunting trophies).	practice exercises, final exam	A1, C4, D1
Interpret game disease (symptoms, pests, hygiene hunting ground, and treatment of patients game mortality).	practice exercises, final exam	A1, C4, D1
Describe the hunting ground (division and arrangement of the hunting ground, hunting productive area, bonitating hunting ground for large and small game)	practice exercises, final exam	A1, C4, D1
Interpret catching wild animals, hunting weapons and ammunition (the proper operation and maintenance of weapons, ammunition, hunting ballistics).	practice exercises, final exam	A1, C4, D1
Explain hunting kinology (division of hunting dogs, working characteristics and methods of dog education and training).	practice exercises, final exam	A1, C4, 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	1.0
Exercises (E)	-	-	-	30	0	1.0
Field work	-	-	-	16	0	0.5
Partial exam (PE)	100%	60-70%	Sufficient (2)	-	104	3.5
		71-80%	Good (3)			



		81-90%	Very good (4)			
		91-100%	Excellent (5)			
<b>TOTAL</b>	<b>100%</b>	<b>(L+E+FW+PE)/100</b>		76	104	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
Final exam (FE)	100 %	60-70% 71-80% 81-90% 91-100%	Sufficient (2) Good (3) Very good (4) Excellent (5)	76	106	6
<b>TOTAL</b>	<b>100%</b>	<b>(FE<sub>xy0</sub>+E<sub>xy0</sub>)/100</b>				

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

Evaluation elements	Description	Deadline	Compensation
Attendance of lectures and exercies	Checks and records attendance of students. A student may justifiably be absent with a maximum of 15% of direct teaching hours.	semester (60 hours of direct lecturer)	-
exercies	Exercies are attended by groups. As part of the exercise, 15 practical exercises from the aforementioned thematic units are performed. At the beginning of the first exercise, students receive task templates, and. Exercies are a condition for accessing the exam.	according to the agreed term	-
Written exam	Exam can be attended by students who have completed and committed exercies. The students in the pre-printed printed exam answer the questions asked. Passage in writing is necessary for passing on the oral exam.	Exam terms	-
Oral exam	The requirement for the entrance to the oral exam is at least 60% of the points collected on the written part of the exam. The final grade is obtained according to the formula <b>(FE<sub>x100</sub>)/100</b>	Exam terms	-



## The basic of forest mechanization

### Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
Describe metering systems, basic metric sizes	Exercises, Partial exam, Final exam	A3
Interpret materials in the construction of forest machines (material types, properties - choice of materials, strength and hardness of materials).	Exercises, Partial exam, Final exam	B9
Interpret the energy in forestry (energy balance of forestry, energy consumption, environmental suitability, toxicity and ecology of liquid fuels and lubricants).	Exercises, Partial exam, Final exam	B9
Interpret the use of forest vehicles and devices (chainsaws, skidders, forwarders, adapted farming tractors forest trucks)	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)	30	30	2
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
Partial exam I (PE I)	40%	60-70% 71-80% 81-90% 91-100%	Sufficient (2) Good (3) Very good (4) Excellent (5)		20	0.5
Partial exam II (PE II)	40%	60-70%	Sufficient (2)	-	25	1
		71-80%	Good (3)			



		81-90%	Very good (4)			
		91-100%	Excellent (5)			
<b>TOTAL</b>	<b>100%</b>	<b>(Ex20 + PEx80)/100</b>		76	75	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)		20	0.5
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
Oral exam (OE)	50%	60-70%	Sufficient (2)		25	1
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
<b>TOTAL</b>	<b>100%</b>	<b>(Ex10+PEIx30+PEIEx60)/100</b> or <b>(Ex10+WEx30+OEx60)/100</b>				<b>1.5</b>

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
Final exam* (FE)	80 %	60-70% 71-80% 81-90% 91-100%	Sufficient (2) Good (3) Very good (4) Excellent (5)			1.5
<b>UKUPNO</b>	<b>100%</b>	<b>(FEx80+Ex20)/100</b>				

\*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 lecturer, excercises, partial or final exams:**

<b>Evaluation elements</b>	<b>Description</b>	<b>Deadline</b>	<b>Compensation</b>
Attendance of lectures, exercies 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 (76 hours of direct lecturer)	-
Exercises prepartion	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 <sup>th</sup> week	
Partial exam II	The achievement of learning outcomes 3, and 4 is checked.	15 <sup>th</sup> 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 asking questions from different parts of the program content. The final grade is calculated according to formula: <b>Ex20+PEx80/100</b>	Exam terms	



## Physical and health education 3

### Learning outcomes and evaluation methods

<b>Learning outcomes (LO)</b>	<b>Evaluation methods</b>	<b>Connection with the study program LO</b>
Describe the structure of the physical exercise class.	exercises, correction and evaluation exercises	D1
Explanation of the impact of physical exercise on health.	exercises, correction and evaluation exercises	D1
Choose fitness exercises designed to strengthen individual muscle groups.	exercises, correction and demonstration	D1
Demonstrate specific exercises with regard to kinesiologic activity.	exercises, structural analysis, assistance, correction and evaluation exercises	D1
Organize constructive free time	Exercises and evaluation exercises	D1
Assess personal diet and physical exercise habits.	exercise, diet diary correction and evaluation exercises	D1
Demonstrate general preparatory exercises and stretching exercises.	exercises, description, demonstration, correction	D1
Understanding kinesiology programs and their target orientation.	vježbe, korekcija i vrednovanje vježbi	D1
Control emotions and strengthen self-control.	Exercises, correction	D1





## Establishment of forests

### Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
Explain forestry seeds (forest seeds and species, maturation and collection, cleansing and sorting, dormancy, forest seed quality elements).	Practicum, Preliminary exam, Final exam	A1, B1, D1
Applied forest nursery and breeding methods in nurseries (division of nurseries, choice of habitats for the establishment of forest nurseries, generative and vegetative propagation of plants).	Practicum, Preliminary exam, Final exam	A1, B6, D1
Describe soil treatment (division, basic and additional soil treatment, depth and volume of soil treatment, basis of equipment and tools used in soil treatment).	Practicum, Preliminary exam, Final exam	B9
Presenting Container Planting (Container Sharing, Planted Container Problems, Root System Deformation, Substrate, Breeding Time, Plant Care in Containers).	Practicum, Preliminary exam, Final exam	B6, D1
Analyze the production technology of the main crops of forest seedlings ( <i>Quercus</i> , <i>Fagus</i> , <i>Fraxinus</i> , <i>Alnus</i> , <i>Betula</i> , <i>Populus</i> , <i>Salix</i> , <i>Abies</i> , <i>Pinus</i> , <i>Picea</i> ).	Practicum, Preliminary exam, Final exam	B6
Appropriate afforestation of the main species of forest trees (raising and cultivation of forest cultures of autochthonous species of shredders and conifers).	Practicum, Preliminary exam, Final exam	B6, B7, 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)	-	-	-	45	0	1.5
Exercises (E)	-	-	-	30	6	1.2
Field work (FW)	-	-	-	24	18	1.4
1. Partial exam (PE1)	50%	60-70%	Sufficient (2)	-	30	1.0
		71-80%	Good (3)			



		81-90%	Very good (4)			
		91-100%	Excellent (5)			
2. Partial exam (PE2)	50%	60-70%	Sufficient (2)	-	27	0.9
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
<b>TOTAL</b>	<b>100%</b>	<b>(P+V+TN+K1x50+K2x50)/100</b>		99	81	6

Evaluation elements	Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students workload outside the direct teaching	ECTS
Final exam* (FE)	100 %	58-67%	Sufficient (2)	-	57	1,9
		68-75%	Good (3)			
		76-83%	Very good (4)			
		84-100%	Excellent (5)			
<b>TOTAL</b>	<b>100%</b>	<b>(Z1x100)/100</b>				
<b>* Students who do not pass during the semester by a written partial exams, approach to final exam which accounts for 100% of the final grade</b>						

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

Evaluation elements	Description	Deadline	Compensation
Lectures (P)	The lectures are checked and the presence of students is recorded. Students may be excluded with a maximum of 20% of direct tuition hours.	semester (45 hours of direct teaching)	-
Exercises (V)	Exercises are checked and students attend. Student may justifiably be absent with a maximum of 10% of direct teaching hours. At the end of the semester, the students submit their exercises based on the instruction given from the beginning of the course on the layout and content of the exercises.	After completing classes	-
Field work (TN)	On-site teaching is checked and the presence of students is recorded and no absences allowed. After completing each	According to the field	-



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	field course, the students are obliged to write and submit a report from the field teaching.	curriculum	
Partial exam (K1)	All students who have enrolled the subject for the first time in the current academic year can access the first queue. In the content of the 1st Column the first half of the tuition is entered. Colloquy is an oral test.	Week 8	There is a possibility of a correction deadline for the colloquium.
Partial exam (K2)	2. Colleges can be accessed by students who have passed the 1st Colloquium. The second half of the semester enters the second half of the tuition. Colloquy is an oral test.  Students placing both oral colloquia get a final grade from a subject that is the arithmetic mean of the grades from the first and second colloquia.	15th week	There is a possibility of a correction deadline for the colloquium.
Written exam	The written exam consists of 6 questions. The exact answer is scored with 1 point, a half answer with 0.5 points, and the inaccurate or empty answer with 0 points. For passage on a written exam you need to collect more than 58% points.	According to the test schedule	-
Oral exam	The requirement for the oral part of the exam is at least 58% of the points collected on the written part of the exam. The final grade is obtained according to the formula $(Z \times 100) / 100$		-



## Forest ecology

### Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
1. Explain water and chemical factors in forests (water cycle, monitoring of water conditions, relations of organisms to water, ecological problems, management and regulation of water in forests).	practice exercises, written tests, oral exam	A1, A3, B3, B8
2. Interpret the parent substrate and the forest soil (distribution and processes of rock decomposition, processes in the soil, features of the forest soils, ecological problems, soil erosion protection).	practice exercises, written tests, oral exam	B3, B8
3. Explain light and heat as ecological factors in forests (influence of light and heat on the habitat and organisms, tolerance to light, methods of measuring light in the forest, changes in air temperature).	practice exercises, written tests, oral exam	B3, B8
4. Explain climate and relief in forests (meteorological factors, climate monitoring, weather stations, climate diagram, ecological problems with relief, impact on plants).	practice exercises, written tests, oral exam	A1, A3, B3, B8
5. Interpret the relationships between forest trees and other plants, animals and microorganisms in forests (parasitism, competition, allelopathy, influence of management).	practice exercises, written tests, oral exam	B3
6. Analyze the dependence of wood biomass production, phenological development and rooting of forest trees on environmental factors.	practice exercises, written tests, oral exam	B4
7. Describe the monitoring of forest conditions, the condition of forest trees and ecological factors in forests (dieback and vitality of trees, causes of disturbances, vitality of trees, tree defoliation, assessment of the forest tree condition).	practice exercises, written tests, oral exam	B5
8. Interpret nonwood forest functions (calculation, evaluation, spatial distribution).	practice exercises, written tests, oral exam	A1, A3, B5

### 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 (La) attendance	5%	100% 90% 80%	Excellent (5) Very good (4) Good (3)	30	-	1



		70%	Sufficient (2)			
Exercises (Ea) attendance	5%	100% 90% 80%	Excellent (5) Very good (4) Good (3)	30	-	1
Field work (FWa) attendance	3%	100%	Excellent (5)	24	-	0.8
Exercises (E)	30%	Partially disordered and incomprehensible, with major corrections and on time	Sufficient (2)	-	35	1.2
		Neat, legible, with major corrections and on time	Good (3)			
		Neat, legible, with minor corrections and on time	Very good (4)			
		Neat, legible, accurate and on time	Excellent (5)			
Partial exam (PE) 2 written tests or 1 final test	30%	40-56%	Sufficient (2)	4	40	1.3
		57-73%	Good (3)			
		74-90%	Very good (4)			
		91-100%	Excellent (5)			
Oral exam (OE)	27%	91-100% 74-90% 57-73% 40-56%	Excellent (5) Very good (4) Good (3) Sufficient (2)	0,5	17,5	0.7
<b>TOTAL</b>	<b>100%</b>	<b>(Lax0,05)+(Eax0,05)+(FWax0,03)+(Ex0,3)+(PEx0,3)+(OEx0,27)</b>		<b>87,5</b>	<b>92,5</b>	<b>6</b>

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 - attendance (La)	5%	70-100% 80-100%	2-5 3-5	30	30	1



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Exercises - Attendance (Ea)	5%			30	30	1
Field Work - Attendance (FWa)	3%	100%	5	24	24	0,8
Exercises and reports from the field work (E)	30%	50-100%	2-5	-	35	1,2
2 written tests or 1 final test (PE)	30%	40-100%	2-5	4	44	1,3
Oral Exam (OE)	27%			0,5	18	0,7
<b>TOTAL</b>	<b>100%</b>					
				<b>(Lax0,05)+(Eax0,05+          (FWax0,03)+(Ex0,3+          (PEx0,3)+(OEx0,27)</b>		

**Detailed description of evaluation elements for lecturer, 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. The student can reasonably be absent from a maximum of 30% lectures and 20% exercises and can not be absent from the field work. Attendance is evaluated by grades 2-5, and this grade is taken when calculating the final grade of the subject.	semester (83 hours of direct lecturer)	Exceptionally, in the case of a justified reason the student should compensate for the lack of individual lectures or field work
Exercises and reports from the field work	Exercises are attended by groups. As part of the exercise is carried out 15 practical exercises in forest ecology. At the beginning of each exercise, students receive task templates and the layout of exercise reports in printed form. Estimated accuracy, neatness and regularity (exercise submitted on time). From each exercise, the student gets a grade and the average of all grades in the exercise is taken when calculating the final score from the subject.	In accordance with the agreed terms.	Exceptionally, in the case of a justified reason, the student draws the absence of the individual exercise.
Partial exam	Students can write two written tests during the semester according to personal choice (first on half of the semester and the second at the end of the semester). Students who score more than 40% of the correct answers from both tests do not write a final written test. Students who do not reach 40% correct answers from the written test are writing the final written test. All test scores are taken in the calculation of the final grade of the subject.	7. and 15. week in semester	Students who do not pass two written tests may take the final written exam.
Written exam	A written final test is written by all students who have not passed two partial written tests during the semester. Students on the previously designed printed exam answer questions. All grades from the written tests participate in the calculation of the final	Exam terms	The student has the right three times to go to the exam.



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	grade of the subject.		
Oral exam	<p>Students who pass a written test and who receive passive grades from exercises, and have passive grades from lectures, exercises, and field work attendance take the oral exam. Each student in the oral exam gets five questions and the number of correct answers refers to certain mark. The final grade of the subject is obtained according to the percentage representation of each grade in the overall rating according to the formula:</p> <p><b><math>(Lax0,05)+(Eax0,05)+(FWax0,03)+(Ex0,3)+(PEx0,3)+(OEx0,27)</math></b></p>	Exam terms	The student has the right three times to go to the exam



## Forest entomology

### Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
To learn taxonomy, morphology, physiology and nutrition of forest insects, and the importance of insects in the forest ecosystem and urban areas	colloquium, seminar work, final exam	B2
Present growth and ontogenetic development in insects (developmental stage, types of larvae, pupae, physiology of metamorphosis, apolysis, ecdosis, ecdosis, hormone system, endocrine glands).	colloquium, seminar work, final exam	B2
Describe the insect sense and communication with the environment in function survival in forest habitat and urban space (sensations of tastes, sight, hearing, smell and taste, intrinsic and interpersonal communication, sexual and aggregate attractants, insect attack symptoms).	colloquium, seminar work, final exam	B2
Define the foundations of the insect ecology of the populations, endangered and rare insect species (fluctuations, oscillations, gradations, gradation types, antagonistic relations and symbiosis, predation and parasitism, endangered and rare insect species, the concept of species preservation through conservation of habitats).	colloquium, seminar work, final exam	B2
Show the most significant pests of urban timber from the group of sucking insects (species from the order of Orthoptera, Thysanoptera and Hemiptera, bionomy, ecology and significance).	colloquium, seminar work, final exam	B2
Show the most significant defoliant of urban wooden plants from the subfamily of butterflies, beetles and other rows.	colloquium, seminar work, final exam	B2
Define the most important xylophages and urban wood destroyers woody plants (xylophagous butterflies, bark beetles, primary and secondary pests in forestry, bionomy, ecology of species and their impact on forest ecosystem).	colloquium, seminar work, final exam	B2
Present insects as molestants and causes allergic reactions to the forest and urban space.	colloquium, seminar work, final exam	B2





Analyze invasive quarantine insect species and their correlation with urban space. colloquium, seminar work, 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)	10%			30	0	1
Exercises (E)	30%	60-70%	Sufficient (2)	30	20	0,75
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
Field education (FE)				24	10	0,25
Partial exam (PE)	30%	60-70%	Sufficient (2)	0	60	4
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
<b>TOTAL</b>	<b>100%</b>	<b>(Lxy0+Exy0 + PExy0)/100</b>		84	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
Final exam (FE)	80 %	60-70% 71-80% 81-90%	Sufficient (2) Good (3) Very good (4)			2



91-100%      Excellent (5)

<b>TOTAL</b>	<b>100%</b>	<b>(FE<sub>xy0</sub>+E<sub>xy0</sub>)/100</b>	<b>2</b>
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**Detailed description of evaluation elements for lecturer, excercises, partial or final exams:**

<b>Evaluation elements</b>	<b>Description</b>	<b>Deadline</b>	<b>Compensation</b>
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 (45 hours of direct lecturer)	-
Partial exam		15. week	
Written exam		Exam terms	
Oral exam			



## Dendrology

### Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
To define and explain biological features and morphological characteristics of the genera of autochthonous gymnosperms (6 genera), allochthonous gymnosperms (18 genera), autochthonous angiosperms (trees - 28 genera, shrubs - 45 genera), allochthonous angiosperms (trees and shrubs - 27 genera), autochthonous and allochthonous angiosperms - vines (10 genera);	partial exams and final exam	B1
To identify and describe the autochthonous and allochthonous gymnosperms according to: habit (21 species), bark (12 species), twigs and buds in winter (5 deciduous species), leaves (49 species), cones and/or seeds (41 species);	partial exams and final exam	B1
To identify and describe the autochthonous and allochthonous angiosperms according to: habit (41 species), bark (27 species), twigs and buds in winter (72 deciduous species), leaves (196 species), flowers (61 species), fruits and/or seeds (123 species);	partial exams and final exam	B1
To use determination keys for autochthonous and allochthonous gymnosperms and angiosperms;	partial exams and final exam	B1
To group autochthonous and allochthonous gymnosperms and angiosperms (trees, shrubs and vines) according to biological features, morphological characteristics, distribution, economic, horticultural and ecological importance;	partial exams and final exam	B1
To choose autochthonous and allochthonous gymnosperms and angiosperms (trees, shrubs and vines) for various purpose in forestry and urban forestry;	partial exams and 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)				45		1.5
Exercises (E)	5%	60-70%	Sufficient (2)	30		1



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		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
Homework (HW)	5%	70-80%	Sufficient (2)		15	0.5
		81-89%	Good (3)			
		90-94%	Very good (4)			
		95-100%	Excellent (5)			
Field work reports, plant collection and herbarium preparation (FWR)				24		0.8
Herbarium exam (H)					6	0.2
Partial exam - gymnosperms (PEG)	30%	60-70%	Sufficient (2)		20	0.7
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
Partial exam - angiosperms (PEA)	60%	60-70%	Sufficient (2)		70	2.3
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
<b>TOTAL</b>	<b>100%</b>	<b>(Ex5+HWx5+PEGx30+PEAx60)/100</b>		<b>99</b>	<b>111</b>	<b>7</b>

<b>Evaluation elements</b>	<b>Maximum points or Share in evaluation</b>	<b>Grade rating scale</b>	<b>Grade</b>	<b>Direct teaching hours</b>	<b>Number of average students workload</b>	<b>ECTS</b>
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				<b>outside the direct teaching</b>	
Final exam (FE)	60%	60-70% 71-80% 81-90% 91-100%	Sufficient (2) Good (3) Very good (4) Excellent (5)	70	2.3
<b>TOTAL</b>	<b>100%</b>	<b>(FEx60+PEGx30+Ex5+HWx5)/100</b>			
* students who do not pass the course through two partial exams during the semester take the final exam that is 60% of the grade and is the same as the partial exam - angiosperms; the remaining 5% is the grade of the exercises, 5% is the grade of the homework and 30% of the partial exam - gymnosperms					

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

<b>Evaluation elements</b>	<b>Description</b>	<b>Deadline</b>	<b>Compensation</b>
Attendance of lectures, exercises and field work	Student attendance is recorded. Student may not be absent more than 20% of lectures and 10% of exercises.	IV semester	
Exercises	The exercises are attended in groups. The practicum exercises enable students to acquire practical skills to recognize woody species on the basis of different morphological characteristics: leaves, twigs of deciduous species in winter, flowers, cones, fruits and seeds. The students use plant material and determination keys. At the end of each exercise the accuracy of determination is evaluated, and the evaluation affects the final grade.	IV semester	
Homework	After each lecture and practicum exercises, the students do their homework and submit it via the Herbarium DEND application. The homework is evaluated and affects the final grade.	IV semester	
Field work reports	After field work students prepare reports. Professor's signature confirms the accuracy of the report.	IV semester	
Herbarium collection and exam	On field work and field exercises students collect herbarium specimens. During the semester they take herbarium exam.	IV semester	
Partial exam - gymnosperms	Access requirements: regular attendance at lectures and exercises, positively graded gymnosperm exercises and homework. The partial exam consists of written and oral part. In the oral part, apart from theoretical knowledge, students have a practical determination of woody species according to different morphological characteristics.	IV semester	
Partial exam - angiosperms	Access requirements: regular attendance at lectures, exercises and field work; positively graded all exercises and homework; signed field work reports; positively graded gymnosperm partial exam; collected herbarium and positively graded herbarium exam. The partial exam consists	IV semester	



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	of written and oral part. In the oral part, apart from theoretical knowledge, students have a practical determination of woody species according to different morphological characteristics. The angiosperm partial exam is the same as the final exam.		
Written exam	Access requirements: professor's signature (regular attendance at lectures, exercises and field work; positively graded all exercises and homework; signed field work reports; positively graded gymnosperm partial exam; collected herbarium and positively graded herbarium exam). The written exam is the same as the written part of the angiosperm partial exam.	Exam terms	
Oral exam	Access requirement: positively graded written exam. In the oral part, apart from theoretical knowledge, students have a practical determination of woody species according to different morphological characteristics. The oral exam is the same as the oral part of the angiosperm partial exam. The final grade is obtained according to the formula: (FEx60+PEGx30+Ex5+HWx5)/100	Exam terms	



## Forest Genetics

### Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
Observing the level of organization and gene expression in forest trees (propagation and heredity in forest trees, cell division, heterozygosity and homozygosity, gene expression, molecular basis structure and function of the gene).	Practise exercises, colloquia, knowledge test, final exam	B6
Apply of basic principles of inheritance in forest trees (Mendel's laws, additive and non-additive inheritance in forest trees, heterozygosity, transgression, hybrids, sexual incompatibility in forest trees).	Practise exercises, colloquia, knowledge test, final exam	B6
Analyze of population genetics and mutations in forest trees (changes in gene frequencies (migration, mutation, selection), Hardy-Weinberg's population equilibrium law, genetic drift).	Practise exercises, colloquia, knowledge test, final exam	B6

### 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%	Extended lectures with less than 15% of acceptable disadvantages of the application of technical standards	Sufficient (2)	30	15	1
		Extended lectures with less than 10% of acceptable disadvantages of the application of technical standards	Good (3)			
		Extended lectures with less than 5% of acceptable disadvantages of the application of technical standards	Very good (4)			
		Extensive lectures without any disadvantages of	Excellent (5)			



		applying technical standards				
Making excersies (E)	30%	Extended lectures with less than 15% of acceptable disadvantages of the application of technical standards	Sufficient (2)	11	30	2
		Extended lectures with less than 10% of acceptable disadvantages of the application of technical standards	Good (3)			
		Extended lectures with less than 5% of acceptable disadvantages of the application of technical standards	Very good (4)			
		Extensive lectures without any disadvantages of applying technical standards	Excellent (5)			
Colloquium from application of biochemical and molecular genetic research in forestry (K1)	30%	60-70%	Sufficient (2)	2	13	0.5
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
Colloquium from the study of the variability of qualitative and quantitative properties (K2)	30%	60-70%	Sufficient (2)	20	13	0.5
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
<b>Total</b>	<b>100%</b>	<b>(Px10+Vx30 + K1x30+K2x30)/100</b>		<b>45</b>	<b>71</b>	<b>4</b>

<b>Evaluation elements</b>	<b>Maximum points or</b>	<b>Grade rating scale</b>	<b>Grade</b>	<b>Direct teaching</b>	<b>Number of average</b>	<b>ECTS</b>
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Share in evaluation		hours	students workload outside the direct teaching	
Final exam (FE)	60%	60-70%	45	1.5
		71-80%		
		81-90%		
		91-100%		
<b>TOTAL</b>	<b>100%</b>	<b>(FEx60+PEGx30+Ex5+HWx5)/100</b>		
* students who do not pass the course through two partial exams during the semester take the final exam that is 60% of the grade and is the same as the partial exam - angiosperms; the remaining 5% is the grade of the exercises, 5% is the grade of the homework and 30% of the partial exam - gymnosperms				

**Detailed description of evaluation elements for lecturer, excercises, 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. Students may be excluded with a maximum of 20% of direct tuition hours. Student activity is recorded.	semester (45 hours of direct lecturer)	-
Making exercises	Exercises are attended by groups. Each exercise is reviewed twice. If the grade is inadequate or not reviewed, it can be submitted in a probationary period (provided that the student does not leave the class more than allowed, that the average grade of all the lessons in the classroom is greater than enough.	15. week	
Colloquium from the method of studying the variability of qualitative and quantitative properties in forest trees. (K1)	The first colloquium can be accessed by students who have a positive evaluation of the 1st Exercise and no less than 20% have abstained from teaching.		
Colloquium from the population structure and frequency of genes and genotypes, genetic equilibrium in forest tree populations. (K2)	Colleges can be accessed by students who have passed the 1st Colloquium. The two colleges are scored with a total of 70 points, each colloquium with 35 points. A total of 42 of 70 points are required for the passage (60%). Students who get enough points from both hands get a final score on the subject. The final grade is the average score from the exercise and the score by the points.		
Written exam	The written exam consists of six assignments. For the passage it is necessary to have 28 points out of a total of 47 points (60%).	Exam terms	



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Oral exam	The requirement for the oral part of the exam is sufficient number of points collected on the written part of the exam. Theoretical knowledge (from the university textbook) is checked. The final grade is obtained according to the formula		
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## Physical and health education 4

### Learning outcomes and evaluation methods

<b>Learning outcomes (LO)</b>	<b>Evaluation methods</b>	<b>Connection with the study program LO</b>
Describe the structure of the physical exercise class.	exercises, correction and evaluation exercises	D1
Explanation of the impact of physical exercise on health.	exercises, correction and evaluation exercises	D1
Choose fitness exercises designed to strengthen individual muscle groups.	exercises, correction and demonstration	D1
Demonstrate specific exercises with regard to kinesiologic activity.	exercises, structural analysis, assistance, correction and evaluation exercises	D1
Organize constructive free time	Exercises and evaluation exercises	D1
Assess personal diet and physical exercise habits.	exercise, diet diary correction and evaluation exercises	D1
Demonstrate general preparatory exercises and stretching exercises.	exercises, description, demonstration, correction	D1
Understanding kinesiology programs and their target orientation.	vježbe, korekcija i vrednovanje vježbi	D1
Control emotions and strengthen self-control.	Exercises, correction	D1



## Silviculture I

### Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
Present morphology, forest dynamics and the structure of the forest stands (morphology of the forest edge and the upper and lower boundaries of the forest, silvidynamic, structure of the forest stands, stand form, dynamics of the stand structure, development stage of the stand).	Partial exam, Exercises, Final exam	B6
Apply the forest tending from the appearance of the young growth to the cleaning (inter-species and the inter-population competition, silvicultural selection, tending under the crowns of old trees, tending of young growth after the final felling, supplementing the insufficiently regenerated areas).	Partial exam, Exercises, Final exam	B6
Explain the tending of forest stand by thinning (goal, intensity, volume, method and interval, influence and effects).	Partial exam, Exercises, Final exam	B6
Present forest regeneration using clearcutting system and edge system (biology and ecology, using of methods, advantages and disadvantages).	Partial exam, Exercises, Final exam	B6
Present forest regeneration using shelterwood system (ecology and biology of process, tree species, shelterwood felling - advantages and disadvantages, preparatory felling, seeding felling, additional fellings, final felling, regeneration period).	Partial exam, Exercises, Final exam	B6
Present forest regeneration using selection system (selection structure, ecological factors in selection forest stand, tree species, functions of tree marking, advantages and disadvantages).	Partial exam, Exercises, Final exam	B6
Present high forest, coppice forest, coppice with standards forest.	Partial exam, Exercises, Final exam	B6

### 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



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Lectures (L)	-	-	-	45	0	1.5
Exercises (E)	10%	60-70%	Sufficient (2)	70	5	2.5
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
Partial exam 1 (PE1)	30%	60-70%	Sufficient (2)	0	30	1
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
Partial exam 2 (PE2)	30%	60-70%	Sufficient (2)	0	30	1
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
Partial exam 3 (PE3)	30%	60-70%	Sufficient (2)	0	30	1
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
<b>TOTAL</b>	<b>100%</b>	<b>(Ex10 + Pe1x30 + Pe2x30 + Pe3x30)/100</b>		115	95	7

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
Final exam (FE)	80 %	60-70%	Sufficient (2)			3
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
<b>TOTAL</b>	<b>100%</b>	<b>(Fex90+Ex10)/100</b>				



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

<b>Evaluation elements</b>	<b>Description</b>	<b>Deadline</b>	<b>Compensation</b>
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 (115 hours of direct lecturer)	-
Partial exam 1	The colloquium consists of 20 questions pertaining to the material from the forest morphology. The colloquium is evaluated and participates in the final evaluation of the subject.	4. week	-
Partial exam 2	The colloquium consists of 20 questions pertaining to the material from the forest tending. The colloquium is evaluated and participates in the final evaluation of the subject.	9. week	-
Partial exam 3	The colloquium consists of 20 questions pertaining to the material from the forest regeneration. The colloquium is evaluated and participates in the final evaluation of the subject.	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	-



## Basic foundations of forest regulation and planning

### Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
to recognize, to distinguish, to explain and to analyse meanings, content and elements of forest regulations and planning (content and type of plans, forest management systems, elements and dynamics of even-aged and uneven-aged stand structures, structure of volume and volume increment)	computational and computer exercises, partial exams, knowledge tests, final	B4, B5
to explain and to discuss principle of sustainability (monitoring system of sustainable forest management, forest certification, prerequisites and constrains of sustainable forest management)	computational and computer exercises, partial exams, knowledge tests, final	B4
to explain, to derive and to calculate models of theoretical forest (forest normality, theoretical growing stock of even-aged forest, theoretical growing stock of selection/uneven-aged forest)	computational and computer exercises, partial exams, knowledge tests, final	B4
to explain, to calculate and to apply time as component of forest regulation and planning (types of maturity, absolute and economic maturity, rotation length, diameter and age of maturity)	computational and computer exercises, partial exams, knowledge tests, final	B4
to explain and to apply space as component of forest regulation and planning and procedures of forest division (basic units of spatial forest dividing, functions of forest management unit dividing, procedures and criteria of forest dividing on compartments/subcompartments)	computational and computer exercises, partial exams, knowledge tests, final	B4, D1
to explain and to calculate possible (theoretical) cut in regulated forest (felling (regeneration) cut, thinning cut, cut in selection/multi-aged forest)	computational and computer exercises, partial exams, knowledge tests, final	B4, 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)	-	-	-	45	0	1.5
Exercises (E)	10%	Partially uncluttered, large correction and on time	Sufficient (2)	30	45	2.0
		Uncluttered, large correction and on time	Good (3)			



		Uncluttered, small correction and on time	Very good (4)			
		Uncluttered, correct and on time	Excellent (5)			
Field education (FE)	-	-	-	16	0	0.5
Partial exam 1 (PE1)	45%	60-70%	Sufficient (2)	0	35	1
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
Partial exam 1 (PE1)	45%	60-70%	Sufficient (2)	0	35	1
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
<b>TOTAL</b>	<b>100%</b>	<b>(Ex10 + PE1x45-PE2x45)/100</b>		91	130	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
Final exam (FE)	90 %	60-70% 71-80% 81-90% 91-100%	Sufficient (2) Good (3) Very good (4) Excellent (5)	0	72.5	2.5
<b>TOTAL</b>	<b>100%</b>	<b>(FEx90+Ex10)/100</b>				

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

Evaluation elements	Description	Deadline	Compensation
Attendance of lectures and exercises	Checking and evidence of student's attendance. Student is allowed exculpatory to absent of maximal 15% hours of direct teaching (10% of exercises and 20% of lectures)	semester (60 hours of direct teaching)	-





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Field work	Checking and evidence of students attendance and their activity. Field teaching is fully obligatory.	semester (15 hours of direct teaching)	Exceptionally, in a case of exculpatory absent student is obliged to prepare seminar or to pass partial exam related on topics of field teaching
Preparing of exercises	Exercises are performing in groups up to 20 students, depending on total enrolled students. There are perform 4 computational, 2 computer and 2 project exercises. At beginning of semester, students get instructions for preparing of files and covers for exercises, and templates which include explanation of topics and actual examples for each exercise. Evaluation include correct, uncluttered and regularity of preparing and delivery of exercise. Exam include	according to defined deadline	Exceptionally student is obliged to work of , in a case of exculpatory absent of several exercise
Written exam	Attendance to exam is allowed to student who regularly gets done and complete all exercises and field teaching. Written exam is possible to pass by two partial exams, at the middle and end of semester, or on exam dates scheduled after semester. Student get in advance prepared knowledge test, which include 10 questions (9 questions are in essay form which can include graphs, and 1 question relate on solving of problem example). Exams include testing and evaluation of knowledge and skills gained on lectures, exercises and field teaching. Attendance to the second partial exam is allowed to student who passed the first partial exam. Written exam is evaluated and contribute in final grade of the course.	defined deadlines of partial exams during semester,  schedule of exam dates	
Oral exam	Prerequisite for oral exam is sufficient grade achieved on written part of partial exam or exam within scheduled exam date. Theoretical knowledge (from book) and understanding of teaching topics within exercises and field teaching are evaluated. The finish grade is get according to equation: <b><math>(Wx40+Ox50+Ex10)/100</math></b>		



## Timber harvesting operations

### Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
Explain the limiting and influential factors of timber harvesting (terrain characteristics, terrain trafficability and vehicle mobility, forest infrastructure networks and forest accessibility, climatic conditions, impact of stand features).	Exercises, Final exam	B9
Define the harvesting plan (motor-manual tree felling and timber processing, mechanised tree felling and timber processing, volume quality estimation of standing trees, utilisation of timber volume during felling and processing).	Exercises, Final exam	B9
Present the timber transport (long distance timber transport, determination of optimum distance between forest roads, type of landing sites, timber truck transport, performance analysis and costs of timber truck transport).	Exercises, Final exam	B9
Analyse timber extraction (primary timber transport by: adapted agricultural tractor, tractor-trailer system, skidder, forwarder, forest skyline and helicopter).	Exercises, Final exam	B9
Present timber harvesting systems (production of forest biomass, timber harvesting in an environmentally sound manner).	Exercises, 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	0	1.0
Exercises (E)	10%	60-70%	Sufficient (2)	30	15	1.5
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			



Field work (FW)	10%	Present, participates passively	Sufficient (2)	32	15	1.5
		Present, closely follows and participates	Good (3)			
		Present, includes with questions and comments	Very good (4)			
		Present, suggests concrete suggestions related to the theme of field work	Excellent (5)			
Test I, II and III	80%	60-70%	Sufficient (2)	0	30	1
		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)			
<b>TOTAL</b>	<b>100%</b>	<b>(Ex10 + FWx10 + FEx80)/100</b>		<b>92</b>	<b>90</b>	<b>6</b>

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
Final exam (FE)	80 %	60-70%	Sufficient (2)			1
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
<b>TOTAL</b>	<b>100%</b>	<b>(FEx80+Ex10+ FWx10)/100</b>				

\* Students who during the semester do not pass the subject by a written test shall attend the exam, that makes 80% of the grade, and the remaining 20% make a grade out of the exercise.

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



<b>Evaluation elements</b>	<b>Description</b>	<b>Deadline</b>	<b>Compensation</b>
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 (92 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 <sup>th</sup> 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 <sup>th</sup> 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 <sup>th</sup> 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	-



## Basics of forest economics

### Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
To explain economics of natural resources and sustainable development (specificity of production in forestry, biological-technical characteristics and economic characteristics).	exercises, final exam	A1
Interpret forest rent and forest tax.	exercises, final exam	A1
Interpret the determination of forests value (methods of evaluation in forestry, problems of total economic value of natural resources)	exercises, final exam	A1
To explain the meaning of forest as capital (fixed assets and capital in forestry, categories of capital goods in forestry).	exercises, final exam	A1
To analyze marketing in forestry (market laws, formation of forest resource prices, supply and demand laws).	exercises, final exam	A2, C5
Present economic analysis and planning in forestry (business indicators, forestry production, outline investment plan and business plan).	exercises, final exam	A3, 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)	10%	-	-	30	0	1
Exercises (E)	10%	-	-	15	0	1
Self-conducting exercises (E)	20%	Partly disordered and incomprehensible, with major corrections and on time	Sufficient (2)		30	1
		Proper, readable, with major corrections and on time	Good (3)			
		Proper, readable, with minor corrections and on time	Very good (4)			
		Proper, readable, accurate and on time	Excellent (5)			



Partial exam (PE)	60%	60-70%	Sufficient (2)	45	1	
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
<b>TOTAL</b>	<b>100%</b>	<b>(Ex20 + PEx80)/100</b>		45	75	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
Final exam (FE)	100 %	60-70%	Sufficient (2)	45		4
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
<b>TOTAL</b>	<b>100%</b>	<b>(FExy0+Exy0)/100</b>				

**Detailed description of evaluation elements for lecturer, excercises, 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 no more than 15%	semester (45 hours of direct lecturer)	-
Self-conducting exercises (E)	Exercises are conducted individually. At the beginning of the first exercise, students receive task templates for all exercises, as well as all necessary info. Evaluation consist of accuracy and time frame in which in necessary to hand exercises.	14 days after the exercise session	Submission after the deadline means getting an additional exercise in agreement with the teacher
Written exam	Students could attend exam with successfully and correct finished exercises. Students on printed written exam work on three calculation tasks. 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 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%	Exam terms	-



## Nature and environmental protection

### Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
Analyze the protection of flora and fauna and the protection of forest ecosystems (rare and endangered species, endemic species of biological diversity, forest management on the basis of endurance, forest in protected areas).	Partial exam , seminars, Final exam	B8
Explain the protection of air, water, soil and biological and landscape diversity of Croatia (protection measures and wastewater treatment, ecological value of soil, factors affecting air pollution and contamination).	Partial exam, seminars, Final exam	B8
Improve waste management, sustainable sustainable development and renewable energy sources (waste management, soil, water and air impact, anthropogenic greenhouse effect).	Partial exam, seminars, Final exam	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	0.5
Exercises (E)	10%	50-70%	Sufficient (2)	11	10	0.5
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
Partial exam (P1)	45%	50-70%	Sufficient (2)	2	25	1.0
		71-80%	Good (3)			



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		81-90%	Very good (4)			
		91-100%	Excellent (5)			
Partial exam (P2)	45%	50-70%	Sufficient (2)	2	25	1.0
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
<b>TOTAL</b>	<b>100%</b>	<b>(Ex20 + P1x40 + P2x40)/100</b>		45	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
Final exam (FE)	80 %	50-70%	Sufficient (2)			4
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
<b>TOTAL</b>	<b>100%</b>	<b>(Fex80+Ex20)/100</b>				

**Detailed description of evaluation elements for lecturer, excercises, 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. Seminar papers are produced in accordance with the assigned topics related to the analyzes and interpretations of the teaching units in the exercises.	semester (45 hours of direct lecturer)	Exceptionally, in the case of a justified reason, the student draws the absence of the individual exercise
Partial exams (P1 and P2)	Students will take the exam from the above mentioned thematic areas.	8. and 15. week	Students who do not attend the partial exams will approach the written and verbal part of the exam
Written exam	The exam is attended by students who have not passed the first and second partial exam. Students who have passed the first and second partial exam only access the verbal part of the exam. The students in the pre-printed exam answer the questions asked, round out the exact answers, describe the images. The written exam is	Exam terms	





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	evaluated and participates in the final assessment of the subject.		
Oral exam	Students who pass a written exam are asking questions from different parts of the program content. The final grade of the subject is obtained according to the formula: <b>(Fex80+Ex20)/100</b>		



## Work safety in forestry

### Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
Explain work safety in forestry - theoretical basics (role of anthropometry, biomechanics and ergonomics in forestry)	practice exercises, partial exam, knowledge test, final exam	C3
Interpret the legal framework of safety in forestry and risk assessment (types of hazards, design and implementation of protection measures).	practice exercises, partial exam, knowledge test, final exam	C3
Present the safety working rules for major forestry works (felling and cutting, skidding / forwarding, silviculture, biological hazards in forestry - hornet sting, tick-borne disease).	practice exercises, partial exam, knowledge test, final exam	C3
Present the organization of safe work on forest working sites (planning of a temporary forest site, procedure in case of accident at work).	practice exercises, partial exam, knowledge test, final exam	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)	-	-	-	30	0	1,5
Exercises (E)	10%	Partially untidy and incomprehensible, with major corrections and on time	Sufficient (2)	15	-	0.75
		Neat, legible, with major corrections and on time	Good (3)			
		Neat, legible, with minor corrections and on time	Very good (4)			
		Neat, legible, accurate and on time	Excellent (5)			
Field work (FW)	10%	Present, participates passively	Sufficient (2)	8	-	0.25
		Present, closely follows and participates	Good (3)			



		Present, includes with questions and comments	Very good (4)			
		Present, suggests concrete suggestions related to the theme of field work	Excellent (5)			
Partial exam (PE)	10%	60-70%	Sufficient (2)	1	15	0.25
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
Final exam (FE)	70%	60-70%	Sufficient (2)	-	22	1.25
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
<b>TOTAL</b>	<b>100%</b>	<b>(FWx10+Ex10 + PEx10 + FEx70)/100</b>		<b>53</b>	<b>37</b>	<b>4</b>

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
Final exam (FE)	80 %	60-70%	Sufficient (2)			1,25
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
<b>TOTAL</b>	<b>100%</b>	<b>(FEx80+Ex10 + FWx10)/100</b>				

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

Evaluation elements	Description	Deadline	Compensation
Attendance of lectures and exercises	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 (45 hours of direct lecturer)	-



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Making exercise	Exercises are attended in groups. As part of the exercise, 14 practical units are performed. Before starting each individual exercise, students receive task templates. At the first exercise session, students receive the folder layout and suggested printed form of sheet in which they will respond to set tasks. Accuracy, neatness and regularity is evaluated (exercise submitted on time).	in accordance with the agreed time	Exceptionally, in the case of a justified reason, the student compensates the absence from the individual exercise
Field work	Within the field work (1 day), an active wood harvesting site is visited, where the groups evaluate the performance of the forestry workers at working phase I and phase II.	according to the plan of field work	Exceptionally, in the case of a justified reason, the student is allowed to compensate field work later on
Partial exam	Students on the previously designed printed exam answer questions, rounds out the correct answers, supplement the key terms within sentences. The partial exam is evaluated and participates in the final grade of the subject.	11. week	Students who pass the partial exam can access the final exam
Written exam	Exams can be attended by students who have fulfilled the requirement of attending lectures and passed partial exam. 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 asking questions from different parts of the program content. The final grade of the subject is obtained according to the formula <b>Ex10+FWx10+PEx10+FEx70/100</b>		



## Forest Roads

### Learning outcomes and assessment

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
Explain forest roads, planning and design. Gain knowledge of technical features of secondary forest roads, relative forest openness, forest roads inventory, conceptual and general project, register of forest road infrastructure.	practical exercises in computer classroom, midterm exam, knowledge test, final exam	B10
Explain the zero line, operational and axial polygon of forest roads (designing zero lines on forest management map and on the ground, integrating the operational polygon into non-linear forest road polygon).	practical exercises in computer classroom, midterm exams, knowledge test, final exam	B10
Define the ground plan of the forest road (constructive elements of the forest road, main elements of the horizontal circular curves, detailed positioning plan, profiling the axis of the forest road route).	practical exercises in computer classroom, midterm exams, knowledge test, final exam	B10
Analyze vertical and normal cross-sections of the forest road (constructive elements of the forest road in the design, incurved and curved grade level, calculation of constituents, leveling of the axis profile of forest road).	practical exercises in computer classroom, midterm exams, knowledge test, final exam	B10
Explain upper and lower forest road layers (calculation of earth volume, earth volume diagram, evidence of measures – preliminary estimate of works and costs).	practical exercises in computer classroom, midterm exams, knowledge test, final exam	B10
Explain the construction and maintenance of forest roads / roads (technology of construction on plains and slopes, type of forest road maintenance, secondary forest road).	practical exercises in computer classroom, midterm exams, knowledge test, final exam	B10

### Assessment method=Exam

Evaluation elements	Share in evaluat.	Grade rating scale	Grade	Direct teaching hours	Number of average students workload outside the direct teaching	ECTS
Lectures	-	-	-	30	0	1
Completion of practical exercises (V)	15%	Partly disordered and incomprehensible, with major corrections and within time	Sufficient (2)	30	10	1



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		Neat, legible, with major corrections and in time	Good (3)			
		Neat, legible, with minor corrections and within time	Very good (4)			
		Neat, legible, accurate and within time	Excellent (5)			
Field work (FW)	5%	Present, participates passively	Sufficient (2)	32	0	1
		Present, closely follows and participates	Good (3)			
		Present, includes with questions and comments	Very good (4)			
		Present, suggests concrete suggestions related to the theme of field work	Excellent (5)			
Midterm exam I, II and III (ME)	(80) %	60-70 %	Sufficient (2)	0	30	1
		71-80 %	Good (3)			
		81-90 %	Very good (4)			
		91-100 %	Excellent (5)			
Exam (WE)	80 %	60-70 %	Sufficient (2)	0	30	1
		71-80 %	Good (3)			
		81-90 %	Very good(4)			
		91-100 %	Excellent (5)			
<b>TOTAL</b>	<b>100%</b>	<b>(Vx15 +FW5 + (ME3x80) + WEx80)/100</b>		92	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
Final exam* (FE)		60-70 % 71-80 % 81-90 % 91-100 %	Sufficient (2) Good (3) Very good(4) Excellent (5)			1
<b>TOTAL</b>	<b>100 %</b>	<b>(ZIx80+Vx15 + FW5)/100 e.g.</b>				



**\* 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 field work**

**Detailed explanation of rules for preparing and taking midterm exams, partial exams, written and oral exams:**

<b>Evaluation elements</b>	<b>Description</b>	<b>Deadline</b>	<b>Compensation</b>
Lectures + practical training	Students' attendance is checked and recorded. Students can be absent with justification from maximum 15 % of direct teaching.	Semester (60 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 practical exercises.	As agreed	Exceptionally, in case of justified reason students may subsequently perform individual practical exercises
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.	5 <sup>th</sup> 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.	10 <sup>th</sup> week	
Midterm exam III	Only students who passed the previous midterm exams can take the third 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 <sup>th</sup> week	
Written exam	The exam can be taken by students who have 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 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: <b><math>(V \times 15 + FW5 + (ME3 \times 80) + WE \times 80) / 100</math></b>		



## Organization basics in forestry

### Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
Explain the study of forestry work (models of study for different levels of application, comparative analysis of existing models).	Exercises, colloquia, test of knowledge, final exam	C1
Apply time and work study (features of work study in forestry, main areas and procedures, work design, work value study).	Exercises, colloquia, test of knowledge, final exam	C1
Analyze work study methods (current observation method, calculation-analytical method of study, work motion study).	Exercises, colloquia, test of knowledge, final exam	C1
Present shaping of organization, organizational structure and types of organizations (organizational design factors and company organizing process, elements and types of organizational structure).	Exercises, colloquia, test of knowledge, final exam	C1
Define economic organizations, organization management and organizational changes (types of economic organizations, business processes, governance bodies, sources and organizational change drivers).	Exercises, colloquia, test of knowledge, final 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)				30		1
Field work				24		0.75
Exercises (E) and writing of seminars from field work	20%	Partly disordered and incomprehensible, with major corrections, on time	Sufficient (2)	30	15	1.5
		Orderly and comprehensible, with major corrections, on time	Good (3)			
		Orderly and comprehensible, with minor	Very good (4)			





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		corrections, on time				
		Orderly, comprehensible and accurate, on time	Excellent (5)			
Colloquia (C2)	80%	60-70%	Sufficient (2)		55	1.75
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
<b>TOTAL</b>	<b>100%</b>	<b>(Ex20 + C2x80)/100</b>		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
Final exam (FE)		60-70%	Sufficient (2)			1.75
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
<b>TOTAL</b>	<b>100%</b>	<b>(FEx80+Ex20)/100</b>				

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

Evaluation elements	Description	Deadline	Compensation
Attendance of lectures, excersies and field work	The student attendance is checked and recorded. Field work and measuring excersises 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 excersises).	semester (60 hours of direct lecturer)	-
Excersises	Excersises are attended in groups. Within excersises methodical, measuring and calculating excersises 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 (excersises handed	in accordance with the agreed terms	Exceptionally, in the case of a justified reason, the student works of the absence of the individual exercise



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	on time) are evaluated		
Colloquia from held teaching material	Students can pass the exam through two colloquia. The students in the prepared printed exam answer the questions asked and solve the calculation tasks. The Colloquia is evaluated and participates in the final grade of the subject upon performed and submitted exercises, according to the formula $(Ex20 + C2x80) / 100$	8. and 15. week	Students who do not pass the colloquia, approach the final exam
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 $(FEx80+Ex20)/100$		



## Forest phytopathology

### Learning outcomes and evaluation methods

Learning outcome (LO)	Assessment	Connection with LO of the study program
Explain causative agents of plant diseases (non-parasitic, parasitic, morphology, reproduction and classification of fungi).	Colloquium, final exam.	B2
Explain biology and physiology of fungi (reproduction, nutrition, specialization, ecological associations).	Colloquium, final exam.	B2
Explain pathogenesis and plant resistance towards pathogens (types and sources of infection, incubation, fructification, resistance factors, plant reaction on pathogenic organism).	Colloquium, final exam.	B3
Explain diseases of fruits and seeds and seedlings (disease symptoms, plant hosts, pathogen harmful effect, and consequences for health of fruits, seeds and seedlings).	Colloquium, final exam.	B2, B3
Analyse diseases of needles and leaves, bark, shoots, branches and stems of forest trees (disease symptoms, biology and harmful effect of the pathogen).	Colloquium, final exam.	B2, B3
Analyse rot fungi of forest trees (their species, most common rot fungi in Croatia, disease symptoms, biology and harmful effect of pathogens, consequences for the health status of affected trees and their economical value).	Colloquium, final exam.	B2, B3
Explain anthropological and abiotic damage on trees (mechanical damage on bark during cut and skidding and forwarding, frost cracks, drought damage, sunscald wounds).	Colloquium, final exam.	B2, B3, B6
Explain harmful hemiparasitic plants (most common hemiparasitic flowering plants on forest trees).	Colloquium, final exam.	B2, B3

### Assessment method

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
Practical exercises (V)	-	-	-	30	0	1



Field classes and field class seminar (TN)	-	-	-	16	4	0.7
Midterm exam on basics of phytopathology (K)	20%	60-70%	sufficient (2)	0	18	0.6
		71-80%	good (3)			
		81-90%	Very good (4)			
		91-100%	excellent (5)			
Exam (PUI)	80%	60-70%	sufficient (2)	0	50	1.7
		71-80%	good (3)			
		81-90%	Very good (4)			
		91-100%	excellent (5)			
<b>TOTAL</b>	<b>100%</b>	<b>(Kx20 + PUIx80)/100</b>		76	72	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
Final exam* (ZI)		60-70% 71-80% 81-90% 91-100%	sufficient (2) good (3) very good(4) excellent (5)	0	68	2.3
<b>TOTAL</b>	<b>100%</b>	<b>(ZIx100)/100</b>				
<b>** students who do not pass the midterm exams during the semester shall take the final exam that makes up 100 % of the grade.</b>						

**Detailed explanation of rules for preparing and taking midterm exams, partial exams, written and oral exams:**

Evaluation elements	Description	Deadline	Compensation
Lectures + practical exercises	Students' attendance is checked and recorded. Students can be absent with justification from maximum 15 % of direct teaching	semester (60 direct teaching hours)	-
Completion of practical exercises	Students attend practical exercises in groups. A total of 15 practical exercises are carried out about microscopic and macroscopic identification of forest shrubs and trees pathogens.	semester (30 direct teaching hours)	In case of justified reason student can additionally compensate for the absence from the exercise.



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Midterm exam on basics of phytopathology	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.	From 15 <sup>th</sup> week	Students who passed midterm exam can take written exam.
Written exam	The exam can be taken by students who attended practical exercises and passes the midterm 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: <b><math>Kx20+PUIx80/100</math></b>		



## Fundamentals of forest protection

### Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
Describing forest protection methods (forest management, biology, biotechnical, chemical and mechanical methods).	Colloquium exams, written and oral exam	B3
Interpreting the damage caused by abiotic and biotic factors in the forests (abiotic factors (late and early frost, floods, sunburn, abundance, drought, wind, snow, ice, fire), damage from fungal pathogenic organisms, large game and small rodents, also interpreting the protection methods).	Colloquium exams, written and oral exam	B3
Describing chemical preparations (chemical plant protection products, substitutes for forest protection).	Colloquium exams, written and oral exam	B3
Applying the protection of forest seeds and young plants.	Colloquium exams, written and oral exam	B6
Describing forest fires as a damage cause to forest ecosystems (forest outbreaks and types of forest fires, classification of forests regarding the fire risk levels).	Colloquium exams, written and oral exam	B3

### 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	-	1,0
Colloquium exam 1	50%	60-70%	Sufficient (2)	-	15,0	0.5
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
Colloquium exam 2	50%	60-70%	Sufficient (2)	-	15,0	0.5
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			



<b>TOTAL</b>	<b>100%</b>		30	30	2
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<b>Evaluation elements</b>	<b>Maximum points or Share in evaluation</b>	<b>Grade rating scale</b>	<b>Grade</b>	<b>Direct teaching hours</b>	<b>Number of average students workload outside the direct teaching</b>	<b>ECTS</b>
Final exam (FE)	100 %	60-74% 75-84% 85-94% 95-100%	Sufficient (2) Good (3) Very good (4) Excellent (5)		30	1

<b>TOTAL</b>	<b>100%</b>					
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**\*students who do not successfully pass colloquium exams, i.e. partial exams during the semester, are required to take the final exam (FE), where the grade from the final exam makes up 100% of the total grade**

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

<b>Evaluation elements</b>	<b>Description</b>	<b>Deadline</b>	<b>Compensation</b>
Attendance of lectures and exercises	The student attendance is checked and recorded. Student absence of max 15% of lectures is allowed.	semester (30 hours of direct lecturer)	-
Colloquium exam 1 Colloquium exam 2	Colloquium exam is evaluated and participate in the final assessment of the subject	8th week 15th week	Students passing a colloquium don't need to take the final exam
Final 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	



## Professional practice

### Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
1. independently and responsibly perform entrusted professional tasks in forestry	Final Exam	
2. apply in practice the knowledge and skills necessary to carry out the entrusted tasks	Final Exam	
3. apply in practice legal regulations from the forestry sector	Final Exam	
4. present professional issues in writing		

### 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
Exercises	-	-	-		0	2
Final exam (ZI)	100%	60-70% 71-80% 81-90% 91-100%	sufficient (2) good (3) very good (4) excellent (5)	0	0	0
<b>TOTAL</b>	100%				40	2

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

Tracking elements	Description	Deadline	Compensation
Professional practice work	The attendance of students is checked and recorded. A student may justifiably be absent with a maximum of 20 % of direct teaching hours.	semester (40 hours of direct teaching)	-





## Bachelor thesis

### Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
1. be able to apply existing knowledge to solve professional problems for the selected topic of bachelor thesis	Final Exam	A1, A2, A3, B1, B2, B3, B4, B5, B6, B7, B8, B9, B10, C1, C2, C3, C4, C5
2. create a term work plan in accordance with the set deadlines for the preparation of the bachelor thesis by components	Final Exam	A1, A2, A3, B1, B2, B3, B4, B5, B6, B7, B8, B9, B10, C1, C2, C3, C4, C5
3. devise a methodology for writing a professional or review paper	Final Exam	A1, A2, A3, B1, B2, B3, B4, B5, B6, B7, B8, B9, B10, C1, C2, C3, C4, C5
4. apply the methodology of writing a professional or review paper	Final Exam	A1, A2, A3, B1, B2, B3, B4, B5, B6, B7, B8, B9, B10, C1, C2, C3, C4, C5
5. present your bachelor thesis in written and oral form	Final Exam	A1, A2, A3, B1, B2, B3, B4, B5, B6, B7, B8, B9, B10, C1, C2, C3, C4, 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	-	-	-			
Exercises	-	-	-			
Final exam (ZI)	100%	60-70% 71-80% 81-90% 91-100%	sufficient (2) good (3) very good (4) excellent (5)			
<b>TOTAL</b>	100%					8

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



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Tracking elements	Description	Deadline	Compensation
	xxxxxxx justifiably be absent with a maximum of 20 % of direct teaching hours.	semester (XX hours of direct teaching)	-
Exercises			-
			-
			-



## Foreign Language-English

### Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
Students will heighten their awareness of correct usage of English grammar in writing and speaking	Final Exam	D1
Students will improve their speaking ability in English both in terms of fluency and comprehensibility	Final Exam	D1
Students will give oral presentations and receive feedback on their performance	Final Exam	D1
Students will increase their reading speed and comprehension of academic articles	Final Exam	D1
Students will strengthen their ability to write academic papers, essays and summaries using the process approach.	Final Exam	D1
Students will read university texts and expand their vocabulary	Final Exam	D1
Students will read for intensive information retrieval and interpretation required by university studies	Final Exam	D1
Students will paraphrase information from outside sources effectively and accurately	Final Exam	D1
Students will summarize information from academic sources, distinguishing between main ideas and details	Final Exam	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	-	-	-	15	0	0.25
Final exam (ZI)	100%	60-70% 71-80% 81-90% 91-100%	sufficient (2) good (3) very good (4) excellent (5)	0	15	0.75
<b>TOTAL</b>	100%			15	15	1



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

<b>Tracking elements</b>	<b>Description</b>	<b>Deadline</b>	<b>Compensation</b>
Lectures	The attendance of students is checked and recorded. A student may justifiably be absent with a maximum of 20 % of direct teaching hours.	semester (15 hours of direct teaching)	-
Written exam	Exams can be taken by students who regularly attended lectures. The written exam is evaluated and participates in the final grade of the course.	examination deadlines	-
Oral exam	Students who pass a written exam are being asked questions from different parts of the entire course content.	examination deadlines	-



## Manners of game hunting

### Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
Interpret trapping and capturing of wild animals (different modes of hunting, a common hunting methods of capturing wild animals traps, ways to capture live wildlife, falconry).	final exam	B2, C4
Present hunting and security measures, and hunting ethics (rules of behavior and safety measures in hunting, procedure for deprived or caught game, hunting records and game offspring).	final exam	B2, C4
Describe hunting clothes and equipment	final exam	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)	-	-	-	15	0	0.25
Partial exam (PE)	100%	60-70%	Sufficient (2)	-	15	0.75
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
<b>TOTAL</b>	<b>100%</b>	<b>(L+PE)/100</b>		15	15	1,0

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
Final exam (FE)	100 %	60-70%	Sufficient (2)	0	15	1.0
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
<b>TOTAL</b>	<b>100%</b>	<b>(FE<sub>xy0</sub>+E<sub>xy0</sub>)/100</b>		15	15	1.0

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



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<b>Evaluation elements</b>	<b>Description</b>	<b>Deadline</b>	<b>Compensation</b>
Attendance of lectures and exercises	Checks and records attendance of students. A student may justifiably be absent with a maximum of 15% of direct teaching hours.	semester (15 hours of direct lecturer)	-
Oral exam	Students are asked questions from different parts of the program content. <b>(FEx100)/100</b>	Exam terms	-



## Forest Mushrooms

### Learning outcomes and evaluation methods

Learning outcome (LO)	Assessment	Connection with LO of the study program
Describe fungi as eukaryotic organisms. Explain role and systematics of fungi. Explain mycorrhizae (ecto and endomycorrhizae). Describe and connect fungal habitats and substrates.	Seminar, final exam.	B2
Describe, list and differentiate among fungal fruiting bodies characteristics significant for identification. Describe and recognize characteristics of cap and hymenophore. Describe and recognize characteristics of stipe (stalk) and volva and their origin. Explain importance of spore colour in a mass for the identification. Describe and recognize characteristics of hymenium and spores in ascomycetes and basidiomycetes. Describe and recognize importance of sterile elements of hymenium in basidiomycetes. Explain, describe and list anatomical and histological characteristics of fruiting body. Explain other characteristics and chemical reactions in fungi and their importance for identification.	Seminar, final exam.	B2
Describe chemical structure of fungi. Describe and list medical properties of fungi. List and explain fungal toxins, their harmful impact on human health, symptoms they cause and possible medical treatments.	Seminar, final exam.	B2

### Assessment method

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)	35%	-	-	0	7.5	0.25
Exam (PUI)	65%	60-70%	sufficient (2)	0	7.5	0.25
		71-80%	good (3)			
		81-90%	Very good(4)			
		91-100%	excellent (5)			



<b>TOTAL</b>	<b>100%</b>	<b>(Sx35 + PUIx65)/100</b>	15	15	1
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**Detailed explanation of rules for preparing and taking midterm exams, seminars, partial exams, written and oral exams:**

<b>Evaluation elements</b>	<b>Description</b>	<b>Deadline</b>	<b>Compensation</b>
Lectures	Students' attendance is checked and recorded. Students can be absent with justification from maximum 15 % of direct teaching.	semester (15 direct teaching hours)	-
Seminar	Seminar presentation is graded and the grade influences on the final course grade.	after 3rd week	-
Oral exam	Students are asked question from different parts of the program. The following formula is used to calculate the final grade for this course:  <b>Sx35+PUIx65/100</b>	Exam terms	





## Ornamental Dendrology

### Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
To use International Code of Nomenclature for Cultivated Plants;	exam	B5
To categorise the most common ornamental species and cultivars of gymnosperms and angiosperms according to morphological characteristics and horticultural importance in Croatia, using a plant list and literature;	exam	B5
To choose the most common ornamental species and cultivars of gymnosperms and angiosperms for various purpose in urban forestry and horticulture, using a plant list and literature;	exam	B5

### 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
<b>TOTAL</b>				15		0.5

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
Final exam (FE)	100 %	60-70% 71-80% 81-90% 91-100%	Sufficient (2) Good (3) Very good (4) Excellent (5)		15	0.5
<b>TOTAL</b>	<b>100%</b>	<b>(FEx100)/100</b>				<b>1</b>

\* students take the final exam that is 100% of the grade

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

Evaluation elements	Description	Deadline	Compensation
Attendance of lectures	Student attendance is recorded. Student may not be absent more than 20% of lectures.	VI semester	



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Written exam	Access requirements: professor's signature (regular attendance at lectures).	Exam terms	
Oral exam	Access requirement: positively graded written exam. The final grade is obtained according to the formula: (FEx100)/100	Exam terms	



## Fires of open space

### Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
Identify the relevance and relevance of the subject matter, consider previous experience at the national and international levels, identify and recognize implementation in similar legal frameworks.	Final exam	B7
Identify the key factors of open space fire, summarize and correlate the importance of the occurrence factors, differentiate between flammability, fuel and moisture content factors.	Final exam	B3
Group firefighting techniques, adapt firefighting systems, describe ways and forms of propaganda.	Final exam	B3

### 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 (S)	20%	50-70%	Sufficient (2)		5	0.166
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
Partial exam (P1)	40%	50-70%	Sufficient (2)		5	0.166
		71-80%	Good (3)			
		81-90%	Very good (4)			
		91-100%	Excellent (5)			
Partial exam (P2)	40%	50-70%	Sufficient (2)		5	0.166
		71-80%	Good (3)			



		81-90%	Very good (4)			
		91-100%	Excellent (5)			
<b>TOTAL</b>	<b>100%</b>	<b>(Sx20 + P1x40 + P2x40)/100</b>		15	15	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
Final exam (FE)	80 %	50-70% 71-80% 81-90% 91-100%	Sufficient (2) Good (3) Very good (4) Excellent (5)	0	10	0.33
<b>TOTAL</b>	<b>100%</b>	<b>(Fex80+Sx20)/100</b>		<b>15</b>	<b>15</b>	<b>1</b>

**Detailed description of evaluation elements for lecturer, excercises, 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. Seminar papers are produced in accordance with the assigned topics related to the analyzes and interpretations of the teaching units in the exercises.	semester (15 hours of direct lecturer)	
Seminar	Seminar papers are produced in accordance with assigned topics related to the teaching units.		
Partial exams (P1 and P2)	Students will take the exam from the above mentioned thematic areas.	8. and 15. week	Students who do not attend the partial exams will approach the written and verbal part of the exam
Written exam	The exam is attended by students who have not passed the first and second partial exam. Students who have passed the first and second partial exam only access the verbal part of the exam. The students in the pre-printed exam answer the questions asked, round out the exact answers, describe the images. The written exam is evaluated and participates in the final assessment of the subject	Exam terms	
Oral exam	Students who pass a written exam are asking questions from different parts of the program content. The final grade of the subject is obtained according to the formula: <b>(Fex80+Sx20)/100</b>		



## Management of forest genetic resources

### Learning Outcomes and Methods of Verification

Learning Outcome (LO)	Verification	Link to the LO of the Study Program
To explain and to distinguish categories of forest genetic resources; To explain the basic methods and procedures for conservation of genetic diversity of forest trees; To identify key legal acts, rules and subjects in the field of conservation of genetic diversity of forest trees.	Final Exam	B4, B6, B8
To discuss the current understanding of the impact of various management interventions on the genetic diversity of forest trees; To apply practical recommendations for good forest management practices.	Final Exam	B4, B6, B8

### Assessment method

Tracking elements	Share in gradeing	Score scale / gradeing	Grade	Number of direct teaching hours	Number of working hours of an average student outside direct teaching	ECTS
Lectures	-	-	-	15	0	0.5
<b>TOTAL</b>	-			15	0	0.5

Tracking elements	Maximum points or share in gradeing	Score scale / gradeing	Grade	Number of direct teaching hours	Number of working hours of an average student outside direct teaching	ECTS
Final exam (ZI)	100%	60-70% 71-80% 81-90% 91-100%	adequate (2) good (3) very good (4) excellent (5)	0	15	0.5
<b>TOTAL</b>	<b>100%</b>			<b>15</b>	<b>15</b>	<b>1.0</b>



**Detailed explanation of the preparation, execution and arrangement of colloquia, seminar papers, partial exams, written and oral exams:**

<b>Tracking elements</b>	<b>Description</b>	<b>Deadline</b>	<b>Compensation</b>
Lectures	The attendance of 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 teaching)	-
Written exam	Exams can be taken by students who regularly attended lectures. The students answer the questions from the entire course content, rounding out the exact answers. The written exam is evaluated and participates in the final grade of the course.	examination deadlines	-
Oral exam	Students who pass a written exam are being asked questions from different parts of the entire course content.	examination deadlines	-



## Animal physiology

### Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
1. Explain the basics of basic cellular and intercellular processes	Final Exam	A3, B8, C1, D1
2. Interpret the processes of growth and development of animal organisms, metabolism and external influences	Final Exam	A3, B8, C1, D1
3. Explain the specifics of digestion and metabolic processes of certain groups of higher mammals (ruminants, omnivores, carnivores)	Final Exam	A3, B8, C1, D1
4. Explain the basic physiology of birds (breathing, flight, moulting)	Final Exam	A3, B8, C1, D1
5. Introduction to the physiology of growth and development of horns in full-horned and hollow-horned	Final Exam	A3, B8, C1, 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	-	-	-	15	0	0.5
Exercises	-	-	-			
Final exam (ZI)	100%	60-70% 71-80% 81-90% 91-100%	sufficient (2) good (3) very good (4) excellent (5)	0	15	0.5
<b>TOTAL</b>	100%			15	15	1

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

Tracking elements	Description	Deadline	Compensation
Lectures	The attendance of students is checked and recorded. A student may justifiably be absent with a maximum of 20 % of direct teaching hours.	semester (15 hours of direct teaching)	-



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Written exam	Exams can be taken by students who regularly attended lectures. The written exam is evaluated and participates in the final grade of the course.	examination deadlines	-
Oral exam	Students who pass a written exam are being asked questions from different parts of the entire course content.	examination deadlines	-





## Melliferous herbaceous plants

### Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
To know the most important melliferous herbaceous plant species.	Final Exam	B4, B6, B7
To define and explain the characteristics of melliferous herbaceous plant species (their systematic affiliation, phenology, biological and morphological characteristics, ecological requirements and distribution in Croatia).	Final Exam	B4, B6, B7
To explain the role of honey species in the ecosystem and the possibilities of their cultivation.	Final Exam	B4, B6, 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	-	-	-	15	0	0.5
Exercises	-	-	-			
Final exam (ZI)	100%	60-70% 71-80% 81-90% 91-100%	sufficient (2) good (3) very good (4) excellent (5)	0	15	0.5
<b>TOTAL</b>	100%			15	15	1

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

Tracking elements	Description	Deadline	Compensation
Lectures	The attendance of students is checked and recorded. A student may justifiably be absent with a maximum of 20 % of direct teaching hours.	semester (15 hours of direct teaching)	-
Written exam	Exams can be taken by students who regularly attended lectures. The written exam is evaluated and participates in	examination deadlines	-



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	the final grade of the course.		
Oral exam	Students who pass a written exam are being asked questions from different parts of the entire course content.	examination deadlines	-



## Basics of digital cartography

### Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
Describe the goals and tasks of digital cartography.	Final Exam	A1, D1
Categorize types and forms of data.	Final Exam	A1, D1
Pronounce the term of cartographic generalization.	Final Exam	A1, D1
Compare and analyze vector and raster digitalization.	Final Exam	A1, D1
Explain and show the georeferencing and orthorectifying procedure.	Final Exam	B4, B5, B8, C4, D1
List the basic elements and characteristics of the map.	Final Exam	B4, B5, B8, C4, D1
Combine a topographic, thematic map with a digital relief model and a digital orthophoto.	Final Exam	B4, B5, B8, C4, D1
Present a database editing and performing various searching with a purpose to obtain a new digital cartographic layer	Final Exam	A1, 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	-	-	-	15	0	0.5
Final exam (ZI)	100%	60-70% 71-80% 81-90% 91-100%	sufficient (2) good (3) very good (4) excellent (5)	0	15	0.5
<b>TOTAL</b>	100%			1530	15	1

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



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<b>Tracking elements</b>	<b>Description</b>	<b>Deadline</b>	<b>Compensation</b>
Lectures	The attendance of students is checked and recorded. A student may justifiably be absent with a maximum of 20 % of direct teaching hours.	semester (15 hours of direct teaching)	-
Written exam	Exams can be taken by students who regularly attended lectures. The written exam is evaluated and participates in the final grade of the course.	examination deadlines	-
Oral exam	Students who pass a written exam are being asked questions from different parts of the entire course content.	examination deadlines	-



## History of Croatian forestry

### Learning outcomes and evaluation methods

Learning outcomes (LO)	Evaluation methods	Connection with the study program LO
Construct appropriate time intervals from the history of man - to - tree relationships. Link Visual and Mathematical Data Presented in Maps, Tables, Charts, and Other Graphic Views		A2
Explaining and Illustrating Information on Geography, Statistics, and Forest Ownership Structure in Croatia. Formulate a view on the significance of forests for the development of civilization, especially in the Mediterranean area. Evaluate the provisions of the oldest statutes of our coastal towns where the relationship between the tree and the forest and their consequences is regulated.	Final Exam	A2
Critically evaluate the influence of the Venetian Republic on the state of the forest in our coast. Valorize the influence of French authorities at the time of the Illyrian provinces on forestry. Compile the timing of constructing events in the development of forestry from 1814 to 1945. To evaluate the meaning of the activities of the Royal Inspectorate for the afforestation of the grazing of the Krajina area - Inspectorate for the afforestation of cliffs, bays and landscaping for the development of forests, forestry and forestry.	Final Exam	A2
Build a timeline in the design of events in the development of forestry starting from the end of the Second World War to the independence of the Republic of Croatia.	Final Exam	A2
To build the stand on the development of forestry after the independence of the Republic of Croatia by analyzing the factors involved. Critically evaluate the impact of forest law provisions on forestry	Final Exam	A2
Evaluate the significance of forestry educational institutions for the development of forestry in Croatia. Assess the cause-and-effect relationship between the state of forests and the development of higher education forestry. Evaluate the main professional and scientific discussions on which some of today's forest management methods are based.	Final Exam	A2

### Methods of grading

Evaluation elements	Share in evaluation	Grade rating scale	Grade	Direct teaching hours	Number of average students workload outside the	ECTS



					<b>direct teaching</b>	
Lectures	-	-	-	15	0	0.5
Final exam (ZI)	100%	60-70% 71-80% 81-90% 91-100%	sufficient (2) good (3) very good (4) excellent (5)	0	15	0.5
<b>TOTAL</b>	100%			15	15	1

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

<b>Tracking elements</b>	<b>Description</b>	<b>Deadline</b>	<b>Compensation</b>
Lectures	The attendance of students is checked and recorded. A student may justifiably be absent with a maximum of 20 % of direct teaching hours.	semester (15 hours of direct teaching)	-
Written exam	Exams can be taken by students who regularly attended lectures. The written exam is evaluated and participates in the final grade of the course.	examination deadlines	-
Oral exam	Students who pass a written exam are being asked questions from different parts of the entire course content.	examination deadlines	-