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

**Graduate study Forestry; Programme: Silviculture and forest management planning with wildlife management**

# Assessment methods and criteria

## Acad. year 2023/24.

## List of learning outcomes for graduate study Forestry - Programme: Silviculture and Forest Management Planning with Wildlife Management

Master Enginnering of forestry with the knowledge gained by the completion of graduate study Forestry - Silviculture and Management Planning with Wildlife Management will be able to:

A - With general engineering competence

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

B - With focused engineering competence

B1. organise and perform tasks of greater complexity in forestry, from forest office and forest management unit as the lowest forestry structural units along the vertical
B2. establish forest management programs and wildlife management programs
B3. implement forest management programs
B4. manage and make independent professional (business) decisions form the field of silviculture and management planning with wildlife management
B5. organise and manage professional works on establishing, caring for, and renewing forest stands
B6. organise and manage professional works in the melioration and management of forest areas in the Mediterranean region
B7. organise and manage professional works on inventorying forests
B8. conduct protection of forests from abiotic and biotic factors, especially fires and organise procedures and means in protection of forests
B9. prepare ecological studies and forestry parts of spatial plans
B10. apply knowledge related to forest machines, techniques and standard technologies used in forestry
B11. apply knowledge related to marketing of forest main and secondary forest products
B12. apply knowledge related to marketing of forest main and secondary forest products
B13. apply knowledge related to the methods for preparing and planning technical works in forestry
B14. manage forest, human resource, and technical potential during performance of forest works
B15. develop current technologies as well as implement new technologies

C - With organizational engineering competence

C1. plan, organise and works of organization of production in forestry
C2. organise and manage works on organization of hunting areasa
C3. plan and calculate production, calculate basic indicators of successful buisness, compose basic financial reports, recognise and analyse types of costs
C4. manage the most complex tasks in all forms of forest organizations, forest and hunting advisory service; forest entrepreneurship
C5. manage tasks of county and national institutions competent for forestry; inspection services
C6. perform jobs of manager/supervisor in protected natural areas

D - With developing engineering competence

D1. conduct buisnesses of scientific and professional associate in scientific-research institutions in the field of forestry
D2. conduct courses in professional secondary and other similar schools
D3. conduct businessses and tasks in publicist writing and media connected with forestry
D4. professionally and scientifically upgrade through different educational ways and postgraduate study
D5. gather, process and interpret reference sources and prepare simplier written professional or scientific paper.

| Course code | General engineering competence | | | Focused engineering competence | | | | | | | | | | | | | | | | Organizational engineering competence | | | | | | Developing engineering cometence | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A1 | A2 | A3 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | B8 | B9 | B 10 | B 11 | B 12 | B 13 | B 14 | B 15 | B16 | C1 | C2 | C3 | C4 | C5 | C6 | D1 | D2 | D3 | D4 | D5 |
| 33884 | | | | | + | | + | | | | + | | | | | | | | | | | | | | | | | | | |
| 33892 | | | | | | + | + | + | | | | + | | | | | | | | | | | | | | + | + | + | + | + |
| 33886 | | | | | | + | + | | + | + | + | | | | | | | | | | | | | | | | | | | |
| 33887 | | | | | | | + | | + | | | | | | | + | | | | | | | | | | + | + | | + | + |
| 33888 | + | | | | + | | + | | | + | | | | | | | | | | | | | | | | + | + | | + | |
| 33918 | + | | | | + | | | | | | | + | | | | | | + | | | | | | | | | | | | + |
| 33919 | + | | + | | | | | | | | | + | | | | | + | + | | | | | | | | + | + | | + | + |
| 73819 | | + | | | | | | | | | | | | | | | + | | | | + | | | | | + | | | | |
| 73820 | + | | | | | | | | | | | + | | | | | | | | | | | | | | + | + | | | + |
| 73821 | + | | | | + | + | | | | | | | + | | | | | | | | | | | | | + | | | | |
| 73822 | + | | | | + | | | | | | | + | | | | | | | | | | | | | | + | | | | |
| 73823 | + | | | | + | | + | | | | | + | | | | | | | | | | | | | | | | | | |
| 73826 | | | | | + | + | | | | | | + | | | | | | | | | + | | | | | + | + | | | |
| 225926 | + | | | | | | | | | | | | | | | + | | | | | | | | | | + | + | | | + |
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| 33885 | + | | | | | + | | | | | | + | | | | | | | | | | | | | | + | + | | + | + |
| 33898 | | | | | | | + | | | | + | | | | | | | | | | | | | | + | | | | | |
| 33891 | + | | + | | + | | | | | | | | | | | | | | | | + | | | | | + | + | | | |
| 33893 | + | + | | | + | + | | | + | | | + | | | | + | | | | | | | | + | | + | | | | |
| 73824 | | | | | | | | + | | | | | | | | + | | + | | | | | | | | + | + | | | |
| 33922 | | | | + | | + | + | + | | | + | | | | | | | | | | | | | | | | | | | |
| 33924 | | | | | | | + | | | | | | | | | | | | | | | | | | | | | | | |
| 33927 | + | | | | + | | + | | | | | + | | | | | | | | | | | | | | | + | | | |
| 33931 | | | | | | | | + | | | | | | | | + | | + | | | | | | | | + | + | | | |
| 33928 | | | + | | | | + | | | | | | | | | + | + | | | + | + | | + | | | | | | | |
| 33925 | + | | | | | | | | | | | | | | | | | | | | | | + | | | + | + | | | |
| 33926 | | | | | | | | | | | | | + | | | | | | | | | | | | | | | | | |
| 33930 | | | | | + | | | | | | | | | | | | | | | | | | | | | | | | | |

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| 33929 | + | + | | | | | | | | | | | | | | | | | | | | | | | | | | + | | + |
| 225930 | + | | | | | | + | | | | | + | | | | | | | | | | | | | | | | | + | + |
| 225931 | | + | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 33894 | | + | | | | | + | + | + | | + | | | + | | | | + | | | | | | | | | | | | |
| 33895 | | | | + | | | | | | | | | | | + | | | | | + | | + | + | | | | | | | |
| 33896 | + | | | | + | | | | | | | | | | | | | | | | + | | | | | | | + | | | |
| 33897 | | | | | | | | | | | | | + | | | | | | | | | | | | | | | | | | |
| 33890 | | | | | | | | + | + | | | | | | | | | | | | | | | | | | | | | | |
| 33932 | + | | | | + | | | | | | | + | | | | | | + | | | | | | | | | | | + | |
| 33940 | | | | | | | | + | | | | | | | | + | | + | | | | | | | | | + | + | | | |
| 33935 | | | | + | | | + | | | + | | | | | | | | | | + | | | | | | | | | | |
| 33937 | | | | | | | + | | | | + | | | | | | | | | | | | | | | + | | | | | |
| 33934 | | | | | | | | | + | | + | | | | | | | | | | | | | | | | | | | | |
| 33933 | | | | | | | + | | | | | | | | | | | | | | | | | | | | | | | | |
| 33939 | | | | | | | | + | | | | | | | | | | | | | | | | | | | | | | | |
| 33936 | | | | + | + | + | | | | | | | | | | | | + | | | | | | | | | | | | | |
| 33941 | | + | | | | | + | | | + | | | | | | | | | | | | | | | | | | | | | |
| 33938 | | + | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 33923 | + | | + | | | + | | | | | | + | | | | | + | | | | | | | | | | + | + | | + | + |
| 225936 | + | + | | | + | + | | | | + | | | | + | | + | | | | | | | | + | + | | | + | | + | + |
| 33899 | | | | | + | | | | | + | | | | | | | | | | | | | | + | + | | | | | | |

# Phytopharmacy in forestry

## Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Describe the emergence, development and role of contemporary phytofarmacy in the integrated protection of forests from plant pests. | Colloquium, final exam. | B2, B4, B8 |
| Explain the underlying concepts and vocabulary (active substance, carrier, working fluid, additives, powder, suspension, emulsion, etc.) and formulas for calculating the required concentration and dose in specific application. | Colloquium, final exam. | B2, B4, B8 |
| Present application methods of plant protection products (introduction to manual and motorized terrestrial devices for the application of plant protection products related to the production of different dimensions of wet particles - sprayers, sprayers). | Colloquium, final exam. | B2, B4, B8 |
| Present the basic groups of insecticides / acaricides (pyrethroids, naturalites, GABA receptor inhibitors, neonicotinoids, IGR formulations), fungicides / bactericides (emphasis on recent active substances and preparations - ingredients of contemporary fungicides), and herbicides, rodenticides and nematocides (in particular, of undesirable phytotoxic effects on a protected plant) according to their chemical, toxicological, functional and other essential properties. | Colloquium, final exam. | B2, B4, B8 |
| Recommend biological preparations, their basic properties, benefits and deficiencies (insecticidal biopesticides - entomopathogenic products fungi, viruses and bacteria with an emphasis on the most important bacterial biopesticides based on *Bacillus thuringiensis* bacteria). | Colloquium, final exam. | B2, B4, B8 |
| Establish legal regulations for the implementation of plant protection activities in forestry. | Colloquium, final exam. | B2, B4, B8 |

**Grade evaluation=Passing the exam**

| 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 |
| Exercise (E) | 0% | none | none | 15 | 0 | 1 |
| Partial exam (PE1) (written) | 0% | The student in the oral colloquium corresponds exactly to 65% of the calculations of concentrations and doses when using pesticides. | none (pass) | 0 | 15 | 0,5 |
| | | The student in the oral colloquium corresponds exactly to 65% of the calculations of concentrations and doses when using pesticides. | none (repeating) | | | |
| Final exam (FE) | 100% | 65-74% | sufficient (2) | 0 | 45 | 1,5 |
| | | 75-84% | good (3) | | | |
| | | 85-94% | very good (4) | | | |
| | | 95-100% | excellent (5) | | | |
| **UKUPNO** | **100%** | **(Ex0 + PE1, PE2, Pe3x0 + FE100/100** | | **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 bodovi |
|---|---|---|---|---|---|---|
| Final exam (FE) | 80 % | 60-70%<br>71-80%<br>81-90%<br>91-100% | Sufficient (2)<br>Good (3)<br>Very good (4)<br>Excellent (5) | | | 1,5 |
| **TOTAL** | **100%** | **(FExy100+Exy0)/100** | | | | **1,5** |

**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. A student may justifiably be absent with a maximum of 15% of direct teaching hours | semester (45 hours of direct lecturer) | - |
| Partial exam | In the form of a written colloquy, the student demonstrates the knowledge of the application of the required and predetermined concentrations and doses in the application of pesticidal compositions. There is no formal assessment but the accuracy of the solution of written assignments of over 65% is considered as a qualified colloquium | 15. week | |
| Written exam | The final written exam can also be passed by a student who has not passed the exam, but then also answers to questions from the entire teaching material. | exam terms | |
| Oral exam | Students who complete the concentration and dose calculation and fulfill their student obligations (attendance) get the right to go to the final exam The final grade in the course is entirely the result of the oral exam result.<br>The final written exam can also be passed by a student who has not passed the exam, but then also answers to questions from the entire teaching material. | | |

# Forest Tree Breeding

### Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| To explain the process of classical breeding of forest tree species, methods of selection; To choose suitable candidates in the process of mass selection; to evaluate individual candidates and choose plus individuals. | Practise exercises, colloquia, knowledge test, final exam. | B3, B4, B5, B9, D1, D2, D3, D4, D5 |
| To perform basic cloning techniques. To explain and compare basic traditional as well as modern methods and techniques of cloning forest tree species. | Practise exercises, colloquia, knowledge test, final exam. | B3, B4, B5, B9, D1, D2, D3, D4, D5 |
| To explain the process of genetic testing of plus trees and the choice of elite trees; To calculate genotypic and additive values of individuals, heritability and genetic gain based on data from a genetic test; To choose elite trees based on genetic testing results. | Practise exercises, colloquia, knowledge test, final exam. | B3, B4, B5, B9, D1, D2, D3, D4, D5 |
| To explain the role of controlled crossing and the activities necessary for the implementation of controlled crossing in the breeding cycle; To choose an option and devise a plan for controlled crossings of elite trees; To design mass production of genetically improved varieties. | Practise exercises, colloquia, knowledge test, final exam. | B3, B4, B5, B9, D1, D2, D3, D4, D5 |

**Grade evaluation=Passing the exam**

| 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 | 0 | 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 applying technical standards. | Excellent (5) | | | |
| Making excersies (E) | 30% | Extended lectures with less than 15% of acceptable disadvantages of the application of technical standards. | Sufficient (2) | 15 | 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) | | | |

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|---|---|---|---|---|---|---|
| | | Extensive lectures without any disadvantages of applying technical standards. | Excellent (5) | | | |
| Colloquium from the study of the Geographic Variability of Forest Trees and Breeding Selection (K1) | 30% | 60-70% | Sufficient (2) | 2 | 45 | 1,5 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| Breeding by mutations, polyploidy, genetic engineering with Breeding (K2) | 30% | 60-70% | Sufficient (2) | 2 | 45 | 1,5 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| Total | **100%** | **(Px10+Vx30 + K1x30+K2x30)/100** | | **49** | **100** | **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% | 60-70% | Sufficient (2) | | 90 | 3 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | **(FEx60+PEGx30+Ex5+HWx5)/100** | | | | |

*** 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 exercise | 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 | |
| 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 | | |

# General and Landscape Ecology

## Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Adopt basic principles for the protection of forests against abiotic and biotic factors and apply basic procedures and means for forest protection. | Practical exercises, test of knowledge, oral exam. | B3 |
| Participate in the implementation of the forest management program. | Practical exercises, test of knowledge, oral exam. | B4 |
| Perform professional field work on founding, care and restoration of forest stands. | Practical exercises, test of knowledge, oral exam. | B6 |
| Perform professional work on melioration and landscaping of forest areas in the Mediterranean area. | Practical exercises, test of knowledge, oral exam. | B7 |
| Cooperate on the development of ecological studies and spatial plans. | Practical exercises, test of knowledge, oral exam. | B8 |

## Grade evaluation=Passing the exam

| Evaluation elements | Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Lectures attendance (La) | 5% | 100%<br>90%<br>80%<br>70% | Excellent (5)<br>Very good (4)<br>Good (3)<br>Sufficient (2) | 30 | 0 | 1 |
| Execises attendance (Ea) | 5% | 100%<br>90%<br>80%<br>70% | Excellent (5)<br>Very good (4)<br>Good (3)<br>Sufficient (2) | 15 | 0 | 0.5 |
| Field work | 3% | 100% | Excellent (5) | 15 | 0 | 0.5 |

| | | | | | | |
|---|---|---|---|---|---|---|
| attendance (FWa) | | | | | | |
| Writing exercises and field practice report (E) | 30% | Partly disordered and incomprehensible, with major corrections and on time. | Sufficient (2) | 0 | 50 | 1,8 |
| | | In order, easy, with bigger corrections and on time. | Good (3) | | | |
| | | In order, easy, with minor corrections and on time. | Very good (4) | | | |
| | | In order, easy, accurate and timely. | Excellent (5) | | | |
| Partial exam (PE) | 30% | 50%-62% | Sufficient (2) | 0 | 48 | 1,6 |
| | | 63%-76% | Good (3) | | | |
| | | 77%-90% | Very good (4) | | | |
| | | 91%-100% | Excellent (5) | | | |
| Oral exam (OE) | 27% | 50%-62% | Sufficient (2) | 0 | 18 | 0,6 |
| | | 63%-76% | Good (3) | | | |
| | | 77%-90% | Very good (4) | | | |
| | | 91%-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | **(Lax0,05)+(Eax0,05)+(FWax0,03)+(Ex 0,3)+(PEx0,3)+(OEx0,27)** | | **60** | **116** | **6** |

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

| Evaluation elements | Description | Deadline | Compensation |
|---|---|---|---|
| Attendance of lectures and exercise | 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 cannot 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 (60 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 grade of the subject. | exam terms | The student has the right three times to go to the exam. |
| Oral exame | 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: (Lax0,05)+(Eax0,05)+(FWax0,03)+(Ex0,3)+(PEx0,3) +(OEx0,27) | exam terms | The student has the right three times to go to the exam. |

# Plant nutrition

## Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Valorize soil as a source of plant nutrients and their absorption mechanisms (soil nutrients, nutrients in helat form, nutrients in mineral and organic matter, dynamic equilibrium among nutrients forms in the soil). | Partial exam, final exam. | B4, B6, D1, D2, D4, D5 |
| To determine the macronutrients (nitrogen, sulfur, phosphorus, potassium, calcium, magnesium; forms of nutrients and their availability, their assimilation in the plant, role in plant metabolism, symptoms of insufficiency) and micronutrients (iron, manganese, copper, zinc, molybdenum and chlorine, their forms in the soil and availability, their role and symptoms of insufficiency). | Partial exam, final exam. | B4, B6, D1, D2, D4, D5 |
| Interpret redistribution of nutrients in the plant (transfer of nutrients among the roots, stems and leaves, the impact of nutrients on vegetative growth and reproductive cycle). | Partial exam, final exam. | B4, B6, D1, D2, D4, D5 |
| To determine the nutrient status of trees in natural ecosystems (absorption, efficiency of nutrients use in forest stands and loss of nutrients form plant and ecosystem). | Partial exam, final exam. | B4, B6, B13, D1, D2, D4, D5 |
| Plan soil fertilization (soil sampling for chemical analysis with the aim of determining appropriate fertilization treatments - mineral, organic or natural fertilizers). | Partial exam, final exam. | B4, B6, B13, D2 |

**Grade evaluation=Passing the exam**

| 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) | 0 | 15 | 0,5 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| Partial exam (PE1) | 35% | 60-70% | Sufficient (2) | 0 | 30 | 1 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| Partial exam (PE2) | 35% | 60-70% | Sufficient (2) | 0 | 30 | 1 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | **(PEE*30+PE1*35+PE2*35)/100** | | **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 points |
|---|---|---|---|---|---|---|
| Final exam (FE) | 70% | 60-70%<br>71-80%<br>81-90%<br>91-100% | Sufficient (2)<br>Good (3)<br>Very good (4)<br>Excellent (5) | | 60 | 2 |
| **TOTAL** | **100%** | **(FE*70+PEE*30)/100** | | | | |

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

| Evaluation elements | Description | Deadline | Compensation |
|---|---|---|---|
| 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 | 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 **p**artial exam. If they do not access the partial exam, they have to take the final exam. | in accordance to the agreed deadline | |

| | | | |
|---|---|---|---|
| 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.<br>If the students have a positive grade in partial exams according to the formula PEEx30 + PE1x35 + PE2x35 they are not required to access the final exam. | in accordance to the agreed deadline | |
| Exercises | Students who fail to pass the Partial exam are obligatory to attend the final exam.<br>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 oraly asked questions from different parts of the program content.<br>The final grade of the subject is obtained according to the formula FEx70 + PEEx30 | in accordance to the exam schedule | |

# Growth and increment

## Learning outcomes and evaluation methods

| Learning outcomes (LO) | Knowledge proof | Connection with the study program LO |
|---|---|---|
| Determining factors which affect growth and increment. | Preliminary exams, final proof. | B2, B4 |
| To analyze growth and increment of individual trees (height, diameter, cross section area and volume increment). | Practise correction and validation, preliminary exams, final proof. | A1, B2, B4, D1, D4 |
| To present development and stand increment (in even-aged stands, pure and mixed; growth and increment of uneven-aged stands, influence of management and habitat changes on tree and stand increment). | Practise correction and validation, preliminary exams, final proof. | A1, B2, B4, D2 |
| To determine stand increment when making management plans (methods of stand growth, data quality of increment calculated for management unit/class level). | Practise correction and validation, preliminary exams, final proof. | A1, B2, B4, B7 |
| To present growth and increment models (simple and complex models with stratified and nonstratified samples). | Practise correction and validation, preliminary exams, final proof. | B2, B4 |

## Grade evaluation=Passing the exam

| Evaluation elements | Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Lectures (L) | - | - | - | 30 | 0 | 1 |
| Exercises (E) | 20% | Partially not clear, with major corrections but on time. | Sufficient (2) | | | |
| | | Clear, with major corrections but on time | Good (3) | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | Tidy, clear, with minor corrections and on time | Very good (4) | 15 | 15 | 1 |
| | | Tidy, clear, without necessary corrections and on time. | Excellent (5) | | | |
| Partial exam 1 (PE1) | 40% | [60-70%) | Sufficient (2) | 0 | 45 | 1,5 |
| | | [70-79,9%) | Good (3) | | | |
| | | [80-90%) | Very good (4) | | | |
| | | [90-100%] | Excellent (5) | | | |
| Partial exam 2 (PE2) | 40% | [60-70%) | Sufficient (2) | 0 | 45 | 1,5 |
| | | [70-80%) | Good (3) | | | |
| | | [80-90%) | Very good (4) | | | |
| | | [90-100%] | Excellent (5) | | | |
| **Total** | **100%** | **(Ex20+ PE1x40+PE2x40)/100** | | **45** | **105** | **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 points** |
|---|---|---|---|---|---|---|
| Final exam* (FE) | 80 % | [60-70%) | Sufficient (2) | | 60 | 2 |
| | | [70-80%) | Good (3) | | | |
| | | [80-90%) | Very good (4) | | | |
| | | [90-100%] | Excellent (5) | | | |
| **TOTAL** | **100%** | **(FEx80+Ex20)/100** | | | | |

*** students which during semester do not pass the exam through colloquium must attend the exam which comprises 80% of grade. Remaining 20% is grade from practise.**

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

| Evaluation elements | Description | Deadline | Compensation |
|---|---|---|---|
| Attendance of lectures and exercise | Student presence is recorded. Maximum lecture absence of 20% and practise absence of 10% are tolerated. | semester (45 hours of classes) | - |
| Exercises (Ex) | In the beginning students are instructed how practise files should look. At the beginning of every practise they get templates and learning materials which contain description of practise thematics with examples. Every practise is evaluated based on accuracy, tidiness and regularity of practise construction and submission. | according to calendar arrangement | - |
| Partial exam | To be able to attend the first colloquium students are required to have correct practise that is related to the colloquium. Colloquium is comprised of 12 questions. To pass the colloquium student needs to collect 60% of maximal points. To attend the second colloquium students are required to pass the first colloquium and have correct practise course. Second colloquium is comprised of 12 questions. To pass the colloquium student needs to collect 60% of maximal points. Students which pass both colloquiums are passed the exam and get the grade. | middle and end of semester | - |
| Written exam (We) | The exam comprises of 12 questions and includes theoretical and practical knowledge that student learned during lectures, practise and field work. To pass the exam student needs to achieve minimum of 60% of exam points. | exam schedule defined on the beginning of semester | - |
| Oral exam (Oe) | Requirement for approaching an oral exam is passed written exam within timeframe of registrated exam date Theoretical knowledge with subject understanding of lectured classes is checked. Final grade is calculated according to following formula (Wex40+Oex50+Ex10)/100 | | - |

# Photointerpretation in forestry

## Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Pronounce the definition of photo interpretation. Explain the visual, measured and digital interpretation. Observe the influence of individual factors on the readability of the images. | Comprehensive exam. | D4 |
| Prepare and describe the image components. Present procedures for image analysis. | Comprehensive exam. | D4 |
| Describe the types and characteristics of Photo interpretation keys. Explain how to make a Photointerpretation key. Analyze the application of photointerpretation in breeding, managing, protection of forests, hunting, ... | Comprehensive exam. | A1, B2, B9, B15, D4 |
| Define scale of aerial photographs. Show aerial photographs orientation. Explain the methods of measurement interpretation to determine the constituent and structural parameters. | Comprehensive exam. | A1, B2, B9, B15, D4 |
| List the methods of digital image processing. Explain the digital interpretation. Identify and compare a controlled and uncontrolled classification. Explain the accuracy of the classification. | Comprehensive exam. | A1, B2, B9, B15, D4 |

## Grade evaluation=Passing the exam

| 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 |
| Comprehensive exam (CE) | 100% | 60-70% | Sufficient (2) | 7,5 | 37,5 | 1,5 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **UKUPNO** | **100%** | **(CEx100)/100** | | **22,5** | **37,5** | **2** |

**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 (15 hours of direct lecturer) | The student work off for absence from the individual lectures term. |
| Regular examination deadlines | All students who have fulfilled their obligations in relation to lectures are eligible to attend a regular exam period. On exam checks knowledge of the entire program (implemented through theoretical lectures). | published examination deadlines | - |

# Application of phytocenology in forest practice

## Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Interpret the application of vegetation research (synecological and vegetation research and their interpretation - identification and description of forest communities, systematic position, change in floral composition and surface, stability of phytocoenoses). | Seminar, final exam. | A1, A3, B9, B15, D1, D2, D4, D5 |
| Valorize the floral composition as an indicator of the disturbance of forest ecosystems (phytocenological recording, biodiversity index, creating an eco-diagram, analysis of the obtained results and making detailed conclusions). | Seminar, final exam. | A1, A3, B9, D1, D4, D5 |
| Present the mapping of forest vegetation (mapping, technical preparation, field work, processing of collected data, creation of a vegetation map). | Seminar, final exam. | A1, A3, B9, B14, B15, D2, D4, D5 |
| Interpret forest vegetation maps and apply them in practice. | Seminar, final exam. | A1, B9, D1, D2 |
| Explain the application of phytocenological research and knowledge in the making and interpretation of management bases, management plans, ecological studies and spatial plans. | Seminar, final exam. | A1, A3, B9, B14, D1, D2, D5 |

**Grade evaluation=Passing the exam**

| Evaluation elements | Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Lectures (L) | - | - | - | 15 | 0 | 0,5 |
| Designing seminar papers (SP) | 20% | Satisfies with major corrections or upgrades. | Sufficient (2) | 0 | 15 | 0,5 |
| | | Satisfies with significant corrections and upgrades. | Good (3) | | | |
| | | Satisfies with minor corrections and upgrades. | Very good (4) | | | |
| | | Satisfies completely. | Excellent (5) | | | |
| Final exam (FE) | 80% | 60-70% | Sufficient (2) | 0 | 30 | 1 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | **(FEx80 + SPx20)/100** | | **15** | **45** | **2** |

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

| Evaluation elements | Description | Deadline | Compensation |
|---|---|---|---|
| Attendance of lectures | The attendance is checked and the attendance of the students is recorded. A student may justifiably be absent with a maximum of 15% of direct teaching hours. | semester (15 hours of direct lecturer) | - |
| Written seminar paper (SP) | In the first half of the semester, the student is given the topic of seminar paper, which the student prepares during the semester, and at the end of the semester submits the lecturer to the exam. If assessed positively, it is accepted as an elaborated seminar paper. | in accordance with the agreed terms | - |

| | | | |
|---|---|---|---|
| Written exam (FE) | Examinations can be attended by students who have completed exercises and preparation and positive evaluation of the seminar paper. The students in the printed exam answer the questions asked. The written exam is evaluated and participates in the final grade of the subject. The final grade is obtained according to the formula (FEx80 + SPx20)/100 | Exam terms | - |

# Zoonoses in forest ecosystems

## Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Comprehend the definition of zoonoses, reservoirs and disease vectors, list the causes of zoonoses and link them to specific zoonoses | Colloquium exam and written exam | D1 |
| Interpret and explain the way of spreading zoonoses, identify and describe the importance of protected forest ecosystems (National Parks, Nature Parks) as natural habitats of zoonotic agents, considering the risk factors for forest workers | Colloquium exam and written exam | C2, D1 |
| Comment on the horizontal and vertical distribution of the Dobrava and Puumala viruses in the protected forests of Croatia, name their reservoirs and spatial distribution according to the latest scientific knowledge | Colloquium exam and written exam | A2, B14 |
| Identify the occurrence of leptospirosis, Lyme borreliosis, tularemia, salmonellosis, lymphocytic choriomeningitis, West Nile fever in protected forests of Croatia, with particular reference to the flood forest of Lonjsko polje and forests of the Plitvice Lakes and Risnjak National Parks, Medvednica, Papuk and Žumberak-Samobor. | Colloquium exam and written exam | A2, B14, D1 |
| Comment on the horizontal and vertical distribution of certain serological variants of Leptospira (floodplain forests of Lonjsko polje Nature Park, forests of the Plitvice Lakes and Risnjak National Parks, Medvednica, Papuk and Žumberak-Samobor. | Colloquium exam and written exam | B14, C2, D1 |

**Grade evaluation=Passing the exam**

| Evaluation elements | Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Lectures | - | - | - | 15 | - | 0,5 |
| Seminar | 33% | Satisfies with major corrections or additions. | Sufficient (2) | - | 15 | 0,5 |
| | | Satisfies with significant corrections and additions. | Good (3) | | | |
| | | Satisfies with minor corrections and additions. | Very good (4) | | | |
| | | Satisfies without and corrections. | Excellent (5) | | | |
| Colloquium exam 1 | 33,3% | 60-74% | Sufficient (2) | - | 15 | 0,5 |
| | | 75-84% | Good (3) | | | |
| | | 85-94% | Very good (4) | | | |
| | | 95-100% | Excellent (5) | | | |
| Colloquium exam 2 | 33,3% | 60-74% | Sufficient (2) | - | 15 | 0,5 |
| | | 75-84% | Good (3) | | | |
| | | 85-94% | Very good (4) | | | |
| | | 95-100% | Excellent (5) | | | |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | | | **15** | **45** | **2** |

| Evaluation elements | Maximum points or Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS points |
|---|---|---|---|---|---|---|
| Final exam (FE) | 100 % | 60-74%<br>75-84%<br>85-94%<br>95-100% | Sufficient (2)<br>Good (3)<br>Very good (4)<br>Excellent (5) | | 30 | 1 |
| **TOTAL** | **100%** | | | | | |
| *** 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 50% of the total grade, and the grade from the seminar also 50%** | | | | | | |

**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 (15 hours of direct lecturer) | - |
| Seminar | Students write and present their seminar work related to relevant forest protection topics | semester | - |
| Colloquium exam 1 Colloquium exam 2 | Colloquium exam is evaluated and participate in the final assessment of the subject | 8th week 15th week or in agreement with the students | Students who pass the colloquium exams don't have to take the final written exam |
| Final exam | Students who have not passed the colloqum exams have to take the written exam. The written exam is graded and participates in the final grade of the course. | exam terms | - |
| Oral exam | Students who pass the written exam and want to raise their final grade can take the oral exam. | exam terms | - |

# Methods of plant taxonomy

## Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| To explain basic principles and terminology in plant taxonomy (phylogeny, plant nomenclature, understanding of the taxon concept, evolution, speciation) | Seminar presentation, written exam. | D1, D2 |
| To use plant identification keys, floristic handbooks, herbarium collections and herbarium material for plant identification. | Written exam. | A1, B9 |
| To define taxonomic problems and to recommend appropriate methods of collecting and processing suitable types of taxonomic data (morphology, anatomy, cytology and biochemistry, phytogeography, paleobotany, molecular taxonomy). | Seminar presentation, written exam. | A1, D5 |
| To analyse taxonomic data and to interpret the obtained results. | Seminar presentation, written exam. | A1, D5 |

## Grade evaluation=Passing the exam

| Evaluation elements | Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Lectures (L) | - | - | - | 14 | 0 | 0,5 |
| Seminar (S) | 50% | Seminar delivered on time. | Sufficient (2) | 1 | 15 | 0,5 |
| | | In addition to prior, student follows the given topic and guidelines, seminar is written clearly. | Good (3) | | | |
| | | In addition to prior, student gives an oral presentation of the seminar. Seminar content | Very good (4) | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | reflects student's effort and interest for a given topic. | | | | |
| | | In addition to prior, seminar reflects deep understanding of the topic. | Excellent (5) | | | |
| Partial exam (PE) | 50% | 55-70% | Sufficient (2) | | 30 | 1 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | **(Sx50 + PEx50)/100** | | **15** | **45** | **2** |

| **Evaluation elements** | **Maximum points or Share in evaluation** | **Grade rating scale** | **Grade** | **Direct teaching hours** | **Number of average students workload outside the direct teaching** | **ECTS points** |
|---|---|---|---|---|---|---|
| Final exam (FE) | 50 % | 60-70% | Sufficient (2) | | 30 | 1 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | **(Fex50+Sx50)/100** | | | | |

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

| Evaluation elements | Description | Deadline | Compensation |
|---|---|---|---|
| Attendance of lectures | Attendance of the lectures is recorded. Students can be excused from 20% of the total lecture hours. | semester (14 hours) | - |
| Seminar | Individual student seminars in which they present a minor taxonomic problem (oral student presentations). Quality of the seminar contributes to the final grade. | 15. week or according to defined term. | Written seminars. |
| Written partial exam | Students who presented their seminar are allowed to approach the partial written exam. The exam has a total of 100 points, 55% of which are needed for a positive grade. Final grade accoring to: (Sx50 + Pix50)/100 | during the semester | - |
| Written final exam | Students who presented their seminar are allowed to approach the final written exam. The exam content is composed of the whole course material and has a total of 100 points, 60% of which are needed for a positive grade. Final grade accoring to: (Fex50+Sx50)/100 | exam terms | - |

# Birds ecology

### Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Definition of ornithophore research methods. technique and technology used in bird research. | Final exam. | A1, D1 |
| The definition requires certain groups of birds, anatomy, mating, nesting, intrageneric and interspecific predation. | Final exam. | A1, B2, D1 |
| Presentation of individual groups (taxonomic categories) with important common features, requirements and specifics of importance to management. | Final exam. | B3, B10 |

### Grade evaluation=Passing the exam

| 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 | 15 | 1 |
| Exam (E) | 100% | 60-70% | Sufficient (2) | 0 | 30 | 1 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | **(L+Ex100)/100** | | **15** | **45** | **2** |

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

| Evaluation elements | Description | Deadline | Compensation |
|---|---|---|---|
| Attendance of lectures and exercise | 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. (FEx100)/100 | exam terms | - |

# Behavioural Ecology

## Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Identify the main scientists and their research that set the foundations of ethological research. | Colloquium and final exam | A1, D1 |
| Identify the difference between the ultimate and proximal causes of animal behavior. | Colloquium and final exam | B9, D1 |
| List the types of innate and learned behaviors. | Colloquium and final exam | B2, B9, D1 |
| Identify the mechanisms responsible for the innate and learned behavior. | Colloquium and final exam | B2, B9, D1, |
| Identify examples of natural and sexual selection and the impact of both on the development and behavior of animal species. | Colloquium and final exam | B2, D1, |
| Identify in nature different types of behavior and appearance of animals due to natural and sexual selection. | Colloquium and final exam | B3, D1 |
| Classify different reproductive strategies of animals with an emphasis on monogamy and polygamy. | Colloquium and final exam | D1 |
| Identify various mechanisms in females and males responsible for brood care. | Colloquium and final exam | B9 |
| Identify sexual dimorphism and identify intrasexual and intersexual selection. | Colloquium and final exam | A1, D1 |
| Identify the main scientists and their research that set the foundations of ethological research. | Colloquium and final exam | A1 |

**Grade evaluation=Passing the exam**

| Evaluation elements | Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Lectures (L) | | | | 15 | - | 0,5 |
| Seminar | 50% | Satisfies with major corrections or additions. | Sufficient (2) | - | 15 | 0,5 |
| | | Satisfies with significant corrections and additions. | Good (3) | | | |
| | | Satisfies with minor corrections and additions. | Very good (4) | | | |
| | | Satisfies without and corrections. | Excellent (5) | | | |
| Exam (E) | 50% | 60-70% | Sufficient (2) | - | 30 | 1 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | | | **15** | **45** | **2** |

**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 (15 hours of direct lecturer) | - |
| Seminar | The seminar work is evaluated and participates (50%) in the final grade | 15th week or in agreement with the students | - |
| Written exam | Written exam is evaluated and participates (50%) in the final grade | exam terms | - |

# Monitoring of animal species

## Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| List and describe the characteristics of the animal population. | Colloquium and final exam | B2, B4 |
| Express the structure of animal populations, its biotic potential and dynamics. | Colloquium and final exam | B2, B4, B9 |
| Describe the spatial distribution of animal species. | Colloquium and final exam | B9 |
| Identify different methods for determining the density of animal populations. | Colloquium and final exam | B2, B9 |
| Choose and combine different methods for determining the density of animal populations depending on the target animal species and the accessibility of its habitat. | Colloquium and final exam | B2, B9 |
| Anticipate barriers that may arise when estimating animal population density. | Colloquium and final exam | B4 |
| List and classify the types of relations between animal populations. | Colloquium and final exam | A1, B2 |
| Identify different methods of animal control with emphasis on biological methods. | Colloquium and final exam | B2 |
| Design, plan and recommend measures to control the abundance of animal species in commercial forests. | Colloquium and final exam | A1, B2 |

**Grade evaluation=Passing the exam**

| Evaluation elements | Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Lectures (L) | - | - | - | 15 | - | 0,5 |
| Seminar paper | 50% | Satisfies with major corrections or additions. | Sufficient (2) | - | 15 | 0,5 |
| | | Satisfies with significant corrections and additions. | Good (3) | | | |
| | | Satisfies with minor corrections and additions. | Very good (4) | | | |
| | | Satisfies without and corrections. | Excellent (5) | | | |
| Exam (PE) | 100% | 60-70% | Sufficient (2) | - | 30 | 1 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | | | **15** | **45** | **2** |

**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 (15 hours of direct lecturer) | - |
| Seminar | The seminar work is evaluated and participates (50%) in the final grade. | 15th week or in agreement with the students | - |
| Written exam | Written exam is evaluated and participates (50%) in the final grade. | exam terms | - |

# Zooecology in forest ecosystems

## Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Interpret homotypic and heterotypic relationships within animal populations. | Colloquium exams and written exam. | B2, B3, B9, C2 |
| Describe primary, secondary and tertiary methods for monitoring the number of animal populations. | Colloquium exams and written exam. | B2, D2 |
| Break down the spatial (microdistribution and macrodistribution) distribution of animal populations in managed forests | Colloquium exams and written exam. | B2, B9 |
| Give examples from the animal world for accidental, accessory and constant species. | Colloquium exams and written exam. | B2, D2 |
| Connect the birth rate and mortality, age structure and reproductive potential with the population size of a certain animal species. | Colloquium exams and written exam. | D1, D2 |
| List, draw and interpret the main elements of the animal population curve | Colloquium exams and written exam. | C2, D2 |
| Analyze the spatial (horizontal and vertical) aspect of population dynamics. | Colloquium exams and written exam. | C2, D2, D1 |
| Link the impact of animal species on the ecological succession of managed forests. | Colloquium exams and written exam. | C2, B4 |
| Break down the periodicity (change of weather, daily, lunar, seasonal, annual) and it's influence on the stability of animal populations in managed forest ecosystems. | Colloquium exams and written exam. | C2, B2 |
| Present and critically judge the anthropogenic impact on animal ecosystems. | Colloquium exams and written exam. | C2, D1, D2 |

**Grade evaluation=Passing the exam**

| Evaluation elements | Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Lectures | - | - | - | 15 | - | 0,5 |
| Seminar | 33,3% | Satisfies with major corrections or additions. | Sufficient (2) | - | 15 | 0,5 |
| | | Satisfies with significant corrections and additions. | Good (3) | | | |
| | | Satisfies with minor corrections and additions. | Very good (4) | | | |
| | | Satisfies without and corrections. | Excellent (5) | | | |
| Colloquium exam 1 | 33,3% | 60-74% | Sufficient (2) | - | 15 | 0,17 |
| | | 75-84% | Good (3) | | | |
| | | 85-94% | Very good (4) | | | |
| | | 95-100% | Excellent (5) | | | |
| Colloquium exam 2 | 33,3% | 60-74% | Sufficient (2) | - | 15 | 0,25 |
| | | 75-84% | Good (3) | | | |
| | | 85-94% | Very good (4) | | | |
| | | 95-100% | Excellent (5) | | | |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | | | **15** | **45** | **2** |

| Evaluation elements | Maximum points or Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS Points |
|---|---|---|---|---|---|---|
| Final exam (FE) | 100 % | 60-74%<br>75-84%<br>85-94%<br>95-100% | Sufficient (2)<br>Good (3)<br>Very good (4)<br>Excellent (5) | | 30 | 1 |
| **TOTAL** | **100%** | | | | | |
| *** 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 50% of the total grade, and the grade from the seminar also 50%** | | | | | | |

**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 (15 hours of direct lecturer) | - |
| Seminar | Students write and present their seminar work related to relevant forest protection topics | Semester | - |
| Colloquium exam 1 Colloquium exam 2 | Colloquium exam is evaluated and participate in the final assessment of the subject | 8th week 15th week or in agreement with the students | Students who pass the colloquium exams don't have to take the final written exam |
| Final exam | Students who have not passed the colloqum exams have to take the written exam. The written exam is graded and participates in the final grade of the course. | exam terms | - |
| Oral exam | Students who pass the written exam and want to raise their final grade can take the oral exam. | exam terms | - |

# Informatology and documentation in scientific research

## Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Differentiate between the stages of scientific work<br>Distinguish different types of scientific publications (primary, secondary, tertiary)<br>Search scientific databases<br>Prepare and hold a methodically designed oral presentation. | 2 partial exams; integral written exam | A1, B13, D1, D2, D5 |

## Grade evaluation=Passing the exam

| Evaluation elements | Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Lectures | - | | - | 15 | 15 | 1 |
| Exercises | - | - | - | - | - | - |
| Partial exams | 100% | 51-60 | Sufficient (2) | 2 | 15 | 1 |
| | | 61-80 | Good (3) | | | |
| | | 81-90 | Very good (4) | | | |
| | | 91-100 | Excellent (5) | | | |
| Exam | 100% | 51-60 | Sufficient (2) | 2 | | |
| | | 61-80 | Good (3) | | | |
| | | 81-90 | Very good (4) | | | |
| | | 91-100 | Excellent (5) | | | |
| **TOTAL** | **100%** | | | **15** | **30** | **2** |

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

| Tracking elements | Description | Deadline | Compensation |
|---|---|---|---|
| Lectures | Attendance of students is regularly recorded at classes (lectures). A student can miss a maximum of 2 hours of class during a semester. | | - |
| 3 partial exams | During classes, predictably in regular class times, students write two partial exams each with a maximum of 10 objective-type tasks. In order to pass the exam successfully, it is necessary to achieve >50% of points on each. Students who have achieved the above-mentioned success in all three partial exams are entitled to the final grade in the course. If they want, they can take the oral exam. | During the lectures | - |
| Written exam | Students who have attended classes regularly can take the exam. The written part of the exam consists of a maximum of 60 objective-type tasks. To pass the exam successfully, it is necessary to achieve > 50% of points. | Exam terms | - |
| Oral exam | The oral part of the exam is taken by students who have passed the written part of the exam. | Exam terms | - |

# Silviculture II

## Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Present silvicultural forming of the forest stands (structure of the virgin forest stands and managed forest stands, principles and methods of silvicultural forming of the forest stand). | Exercises, final exam. | B5 |
| Identify the genesis of forest stands and the choice of regeneration methods (physiological, habitat, orographic and biotic preconditions for generative and vegetative natural regeneration, features of artificial regeneration of forest stands). | Exercises, final exam. | B5 |
| Present regeneration of the forests on small surfaces and combined regeneration methods (irregular shelterwood systems). | Exercises, final exam. | B5 |
| Present the silvicultural aspects of special forest management and conversion methods (forests with protective function, forests of special purpose, cases of drying and decay of trees and stands of different tree species, conversion of degradation forms of forests). | Exercises, final exam. | B5 |
| Formulate silvicultural planning (sustainable forest management and multipurpose progressive sustainable management concept). | Exercises, final exam. | B4 |

## Grade evaluation=Passing the exam

| Evaluation elements | Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Lectures (L) | - | - | - | 30 | 0 | 1 |
| Exercises (E) | 20% | 60-70% | Sufficient (2) | 71 | 4 | 2,5 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | 91-100% | Excellent (5) | | | |
| Exam (Ex) | 80% | 60-70% | Sufficient (2) | 0 | 45 | 1,5 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | **(Ex20 + Pex80)/100** | | **101** | **49** | **5** |

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

| Evaluation elements | Description | Deadline | Compensation |
|---|---|---|---|
| Attendance of lectures and exercise | 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) | - |
| Written exam | Examinations can be attended by students who have completed exercises and field teaching. The students in the printed exam answer the questions asked. The written exam is evaluated and participates in the final grade of the subject. | exam terms | - |
| Oral exam | Students who pass a written exam are asking questions from different parts of the program content. | exam terms | - |

# Forest vegetation

### Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Present the forest vegetation of Croatia from the ecological, flora-genetic, syntaxonomic and biogeographic point of view (synecological conditions for the development of different vegetation types in Croatia, horizontal and vertical classification, phytogeogaphic features, syntaxonomy of forest communities, threatened and rare forest communities, protected, rare and threatened species). | Preliminary exam, final exam. | A1, B3, B9, D1, D2, D4, D5 |
| Present occasionally floody and humid forest communities (planar belt of the continental region, floodplain and wetland communities forests and bushy communities, moist lowland communities, protected and threatened plant species, community status towards National classification of habitats and Natura 2000 network). | Preliminary exam, final exam. | A1, B3, B9, D1, D2, D4, D5 |
| Classify the oak-hornbeam forests and the thermophilic acid forest communities of the coline-submontane belt (ecological factors in the formation of vegetation types and forest communities of the coline-submontane belt, acidophilic vegetation macrotypes in the coline-submontane belt of Europe, threatened forest communities). | Preliminary exam, final exam. | A1, B3, B9, D1, D2, D4, D5 |
| Compare the beech forests of Croatia and the Illyrian floral province (development in the Holocene, Central European beech forests, beech forests of the Illyrian floral province, beech forests in Croatia, syntaxonomic classification, bio-geographic features). | Preliminary exam, final exam. | A1, B3, B9, D1, D2, D4, D5 |

| | | |
|---|---|---|
| Present forest communities of Noble hardwoods (areal, characteristics of habitat, biogeographical analysis, the main vegetation macrotypes in Europe, forest communities of the Dinaric area, forest communities of the Pannonian-mountainous belt, evaluation and vulnerability of forest communities). | Preliminary exam, final exam. | A1, B3, B9, D1, D2, D4, D5 |
| Classify the thermophilic forests and coppice of pubescent oak, Hungarian oak and turkey oak (areal and ecological conditions, main vegetative macrotype, syntaxonomic classification, community status towards National classification of habitats and Natura 2000 network threatened and protected plant species). | Preliminary exam, final exam. | A1, B3, B9, D1, D2, D4, D5 |
| Present dry, basophilic pine forests on dolomites (historical and ecological factors for the development of the forest, main vegetation macrotypes, syntaxonomic classification, endemic species and relics). | Preliminary exam, final exam. | A1, B3, B9, D1, D2, D4, D5 |
| Present the boreal coniferous forest (areal and ecological characteristics of the boreal zone in Europe, forests and other boreal vegetation types in Croatia). | Preliminary exam, final exam. | A1, B3, B9, D1, D2, D4, D5 |
| Classify forest vegetation of the coastal zone of the Mediterranean region (horizontal and vertical classification, ecological conditions, vegetation types, degradation stages, flora of Mediterranean forests in urban areas). | Preliminary exam, final exam. | A1, B3, B9, D1, D2, D4, D5 |

**Grade evaluation=Passing the exam**

| 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 | 0 | 1 |
| | | 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 x3 (Pe) | 80% | 60-70% | Sufficient (2) | 0 | 90 | 3 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | **(Ex20 + Pex80)/100** | | **60** | **90** | **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 bodovi |
|---|---|---|---|---|---|---|
| Final exam* (FE) | | 60-70%<br>71-80%<br>81-90%<br>91-100% | Sufficient (2)<br>Good (3)<br>Very good (4)<br>Excellent (5) | | 90 | 3 |
| **TOTAL** | **100%** | **(FEx80+Ex20)/100** | | | | |

*** 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, exercises, partial or final exams:**

| Evaluation elements | Description | Deadline | Compensation |
|---|---|---|---|
| Lectures + exercise + 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 (60 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 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. | 8. week | - |
| 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. The total is required to collect 60% of points on both the partial exam for passing. | 15. week | |

| | | | |
|---|---|---|---|
| 3.Partial exam | The third partial exam can be accessed by students who have completed lectures, exercises and field teaching. Students on pre-prepared herbal materials must identify plant species and associate them with the type of habitat and the communities they are associated with. The partial exam is evaluated with a rating passed or repeated. Passage is a condition for entering a final grade. | end of semester, exam terms | |
| 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 | - |

# Integrated forest protection

## Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| To counteract harmful biotic and abiotic factors - determination, diagnosis of health status and planning of control strategy (importance and role, preventive and curative measures of active protection, identification of most common plant diseases, identification of fungal fungi, symptoms of attack pests and symptoms of damage caused by abiotic factors and other zoobytic harmful factors). | Seminar work, final exam. | B4, B8, C6 |
| Present an assessment of the intensity of attack of harmful biotic factors and Quantifying the density of their populations and implementing repressive protection measures - aviomethods in forest protection (methods of determining the number and density of the population (abundance) of individual pests and plant diseases, technologies used recently in the protection of forests from the air). | Seminar work, final exam. | B4, B8, C6 |
| Valorize integrated protection in lowland regular oak forests, forests of common beech and oak trees, and forts of forests beans and fir (valorization of the role of some well-known harmful biotic factors as well as those most recently discovered, as well as climatic conditions and anthropogenic interventions, on the basis of a comprehensive analysis, consider options and opportunities to undertake preventive and repressive measures of integrated protection). | Seminar work, final exam. | B4, B8, C6 |
| Present integrated protection in Mediterranean forests and their degradation stages (the greatest attention is paid to the analysis of appearance, dynamics of spread, detrimental effects and fire prevention capabilities open space, also considers the importance of some specific organisms that occasionally appear in this area as a dominant detrimental factor for forest stands). | Seminar work, final exam. | B4, B8, C6 |

| | | |
|---|---|---|
| To propose integrated protection in nurseries, forest cultures and intensive plantations of special purpose (there are considered increased risks and actual danger of increased occurrence of numerous harmful factors of biotic and abiotic nature, as well as protection measures - mechanical, physical, chemical, biotechnical, biological). | Seminar work, final exam. | B4, B8, C6 |
| Connect invasive pests and the consequences of their entry to implementation. Integrated forest protection measure (pest control system, plant protection quarantine and plant control system and the most efficient methods prevention and curative (monitoring, early eradication, dissolution slowdown) in context of known measures and procedures of integrated forest protection). | Seminar work, final exam. | B4, B8, C6 |
| Predict the organization and monitoring system of biotic and abiotic harmful factors - reporting forecasting jobs in integrated forest protection (the most commonly used monitoring methods, their advantages and disadvantages are compared). | Seminar work, final exam. | B4, B8, C6 |
| Present insects as molest ants and causes allergic reactions to the forest and urban space. | Seminar work, final exam. | B4, B8, C6 |
| Analyze invasive quarantine insect species and their correlation with urban space. | Seminar work, final exam. | B4, B8, C6 |

**Grade evaluation=Passing the exam**

| 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) | 0% | - | - | 30 | 0 | 1 |
| Seminar (S1) | 30% | Student through the seminar handles the default | 50-64% sufficient (2)<br>65-74% good (3)<br>75-84% very good (4) | 0 | 40 | 1,5 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | problem / topic. | 85-100% excellent (5) | | | |
| Final exam (FE) | 70% | 65-74% | Sufficient (2) | 0 | 80 | 2,5 |
| | | 75-84% | Good (3) | | | |
| | | 85-94% | Very good (4) | | | |
| | | 95-100% | Excellent (5) | | | |
| **UKUPNO** | **100%** | **(Ex0 + S1x30 + FEx70)/100** | | **60** | **120** | **6** |

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

| Evaluation elements | Description | Deadline | Compensation |
|---|---|---|---|
| Attendance of lectures and exercise | 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 (60 hours of direct lecturer) | Exceptionally, only in the case of a teacher's disability (field courses at other courses). |
| Partial exam | Exercises are attended by groups. As part of the exercise, 15 thematic units are conducted through 15 exercises. At the beginning of the first exercise, students are provided with information on how to conduct the exercise and their content. During the implementation of each exercise, the accuracy and understanding of the content of the exercise is verified, verbally by examining individual students and verifying each exercise individually without assigning a grade. | at the end of each exercise, in the teaching room | No compensation. |
| Seminar | As a seminar presentation / presentation, the student demonstrates the learned knowledge of solving a problem in the context of integrated forest protection (according to the performance program). Structured exposes the problem through diagnosis, analysis and proposal of solutions-taking protective measures (preventive and curative) | the second third of semester | No compensation. |
| Oral exam | Students who exhibit and evaluate their seminar and fulfill their student obligations (attendance at the lectures and field teaching) are entitled to attend the final exam The final grade of the course is the result of a combination of a seminar evaluation and an oral final exam.<br>The final written exam can not be equally accessible to a student who did not give up the seminar. | regular and extraordinary examination deadlines | |

# Hunting management I

## Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Define wildlife habitat, hunting ground, and hunting grounds for certain game species (determining hunting productive areas, habitat quality for large and small game, determining the hunting capacity for each species of game). | Practice exercises, final exam. | A1, A3, B2 |
| Presenting game management (optimum sex and age structure of game in the population, growth and recharge, dump, waste, development of large and small game stocks, planning the required amount of game food). | Practice exercises, final exam. | B2, C2 |
| Comply with the technical arrangement of hunting grounds (hunting grounds - feeding tanks, dormitories, eating areas, food storage, dummies, observatories and checkers, ...). | Practice exercises, final exam. | B2, C2, D2 |
| Establish protected species (protection and revitalization plans of endangered species, wildlife conservation programs, action plans, management plans). | Practice exercises, final exam. | B2, D1 |

## Grade evaluation=Passing the exam

| 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 | - | - | - | 15 | 0 | 0,5 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Exam (E) | 100% | 60-70% | Sufficient (2) | 0 | 45 | 1,5 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | **(Ex100)/100** | | **75** | **45** | **4** |

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

| Evaluation elements | Description | Deadline | Compensation |
|---|---|---|---|
| Attendance of lectures and exercise | Checks and records attendance of students. A student may justifiably be absent with a maximum of 15% of direct teaching hours. | semester (45 hours of direct lecturer) | - |
| Exercise | Exercises 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. Exercises 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 exercises. 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.<br>The final grade is obtained according to the formula (Ex100)/100 | exam terms | - |

# Soil management of forest ecosystems

## Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Analyze the roles of soil. Critically envisage the significance of individual roles of soil. Recognize the importance of soil in forestry. | Partial examination, laboratory exercises, full examination. | A2 |
| Classify soils. Compare soils according to the national and WRB-classification system. Compare the properties of individual soils. Assess the properties that are crucial to the fertility of individual soil, especially from the aspect of the ecological requirements of forest trees. Assess the properties that are crucial to the sensitivity of individual soil to harmful influences. | Partial examination, laboratory exercises, full examination. | B2, B3, B9 |
| Present the method of making and the nature of the soil map. Present the application of soil maps. Compare examples of the use of soil maps. To present the pedogeographic units of forest ecosystems in Croatia. | Partial examination, laboratory exercises, full examination. | A1, D1 |
| Explain the special nature of soil in the management of forest ecosystems in relation to the management of other terrestrial ecosystems. | Partial examination, laboratory exercises, full examination. | A2, B9 |
| Evaluate the soil within the soil value rating system. To assess the nature of the relationship between individual soils in forest ecosystems in Croatia. | Partial examination, laboratory exercises, full examination. | B6, B13, D1 |
| Compare geogenic and limit values of harmful substances in the soil. Valorize the soil with regard to damage. Assess the harmful effects on the soil of forest ecosystems (economic effects - especially through remote transmission of harmful substances, the impact of forest fires, multi-purpose use of forest land, conversion of forest land) and present measures for its protection. | Partial examination, laboratory exercises, full examination. | B9, C5, D1 |

| | | |
|---|---|---|
| Propose soil monitoring of forest ecosystems. Compare the state of soil protection at the global, regional and national level. Review regulations aimed at soil protection and evaluate their implementation. | Partial examination, laboratory exercises, full examination. | B9, C5 |

**Grade evaluation=Passing the exam**

| 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 | 10 | 1,3 |
| Laboratory exercises (LE) | - | - | - | 15 | 15 | 1 |
| Field courses (FC) | - | - | - | 8 | 1 | 0,3 |
| Exam (E) | 100 % | 50-60 % | Sufficient (2) | 4 | 37 | 1,4 |
| | | 61-75 % | Good (3) | | | |
| | | 76-90 % | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | **(Ex100)/100** | | **57** | **63** | **4** |

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

| Evaluation elements | Description | Deadline | Compensation |
|---|---|---|---|
| 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 (45 hours of direct teaching) | - |
| Laboratory Exercises (LE) | Exercises are attended by groups. Four practical exercises are performed (soil nutrients, harmful substances, micro aggregate stability, consistency) | 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 course is performed as complex field course, 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 ~ 50% 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 50% of the subjects provided by the theoretical program.<br>Partial exams can be accessed by students who have no more than one absence from the lectures. Those 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.<br>The arithmetic mean of the two grades represents the grade of the exam that) gives the final grade. | agreement with the students in second half of the semester. | - |
| Full exam (FE) | 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.<br>A written exam is a condition for access to an oral exam, when gets a final grade. | published test deadlines. | - |

# Biotechnology in forestry

## Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Describe the possibilities of applying biotechnology in the field of forestry. | Seminar, final exam | B5, B13, B15, D1, D2 |
| Describe the application of molecular markers in research and conservation of forest genetic resources, distinguish the applications of different molecular markers in accordance with research needs. | Seminar, final exam | B5, B13, B15, D1, D2 |
| Present the basics of application of the most advanced methods of biotechnology in forestry (genomics, transcriptomics, associative and comparative genomics). | Seminar, final exam | B5, B13, B15, D1, D2 |
| Describe the application of biotechnological methods in EX SITU conservation of genetic resources. | Seminar, final exam | B5, B13, B15, D1, D2 |
| Describe tissue culture methods and their differences, support with examples | Seminar, final exam | B5, B13, B15, D1, D2 |
| Understand the application of genetically modified organisms in forestry and discuss biosafety issues | Seminar, final exam | B5, B13, B15, D1, D2 |

**Grade evaluation=Passing the exam**

| Evaluation elements | Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Lectures (L) | - | - | - | 15 | 0 | 0,5 |
| Designing seminar papers (SP) | 20% | Satisfies with major corrections or upgrades. | Sufficient (2) | 0 | 15 | 0,5 |
| | | Satisfies with significant corrections and upgrades. | Good (3) | | | |
| | | Satisfies with minor corrections and upgrades. | Very good (4) | | | |
| | | Satisfies completely. | Excellent (5) | | | |
| Final exam (FE) | 80% | 60-70% | Sufficient (2) | 0 | 30 | 1 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | **(FEx80 + SPx20)/100** | | **15** | **45** | **2** |

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

| Evaluation elements | Description | Deadline | Compensation |
|---|---|---|---|
| Attendance of lectures | The attendance is checked and the attendance of the students is recorded. A student may justifiably be absent with a maximum of 15% of direct teaching hours. | semester (15 hours of direct lecturer) | - |
| Written seminar paper (SP) | In the first half of the semester, the student is given the topic of seminar paper, which the student prepares during the semester, and at the end of the semester submits the lecturer to the exam. If assessed positively, it is accepted as an elaborated seminar paper. | in accordance with the agreed terms | - |
| Written exam (FE) | Examinations can be attended by students who have completed exercises and preparation and positive evaluation of the seminar paper. The students in the printed exam answer the questions asked. The written exam is evaluated and participates in the final grade of the subject. The final grade is obtained according to the formula (FEx80 + SPx20)/100 | exam terms | - |

# Ecological Monitoring

### Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Identify tree species on the basis of morphological features, identify tree parts and shapes, and apply theoretical and practical knowledge of economically important indigenous and allochthon species of trees and shrubs. | Tests of knowledge, oral exam. | B1 |
| Adopt the fundamental principles of protecting the forests of abiotic and biotic factors, especially from the fires, and apply the basic procedures and means to protect the forests. | Tests of knowledge, oral exam. | B3 |
| Participate in the implementation of the forest management program. | Tests of knowledge, oral exam. | B4 |
| Carry out works on forest inventory. | Tests of knowledge, oral exam. | B5 |
| Collaborate on the development of ecological studies and spatial plans.. | Tests of knowledge, oral exam. | B8 |

### Grade evaluation=Passing the exam

| Evaluation elements | Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Lectures (L) attendance | 10% | 100% - 5, 90% - 4, 80% - 3, 70% - 2 | - | 15 | - | 0,5 |
| Partial exam (PE) | 45% | 50-62% | Sufficient (2) | 4 | 25 | 1 |
| | | 63-76% | Good (3) | | | |
| | | 77-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Oral exam (OE) | 45% | 50-62% | Sufficient (2) | 0,5 | 15,5 | 0,5 |
| | | 63-76% | Good (3) | | | |
| | | 77-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | **(Lx0,1)+(PEx0,45)+(OEx0,45)** | | **19,5** | **40,5** | **2** |

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

| Evaluation elements | Description | Deadline | Compensation |
|---|---|---|---|
| Attendance of lectures | The attendance is checked and the attendance of the students is recorded. The student can reasonably be absent from a maximum of 30% lectures. Attendance is evaluated by grades 2-5, and this grade is taken when calculating the final grade of the subject. | semester (15 hours of direct lecturer) | Exceptionally, in the case of a justified reason the student should compensate for the lack of individual lectures. |
| 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 grade of the subject. | exam terms | The student has the right three times to go to the exam. |

| | | | |
|---|---|---|---|
| Oral exam | Students who pass a written test and who receive passive grades from lectures 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: (Lx0,1)+(PEx0,45)+(OEx0,45) | exam terms | The student has the right three times to go to the exam. |

# Game and Shooting Crops

## Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Managing and autonomous making decision in wildlife/game management | Oral exam. | B4 |

## Grade evaluation=Passing the exam

| Evaluation elements | Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Lectures (L) | 0% | | | 15 | 0 | 0,5 |
| Exam (E) | 100% | 60-70% | Sufficient (2) | 0 | 45 | 1,5 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | **(Ex100)/100** | | **15** | **45** | **2** |

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

| Evaluation elements | Description | Deadline | Compensation |
|---|---|---|---|
| Attendance of lectures and exercises | The student attendance is checked and recorded. Student absence of max 15% of lectures is allowed. | semester (15 hours of direct lecturer) | - |
| Partial exam | - | - | |
| Written exam | Exceptionally (f.e. for students with speech disorder). | exam terms | |
| Oral exam | Asks from different parts of course content. | exam terms | |

# Forest area measurement

### Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Comparing types of inventories in forestry. | Final proof. | B2, B4, D2 |
| Interpret the meaning of national forest inventories and methods of data collection during inventory conduction. | Final proof. | B2, B4, B9 |
| Critically judge differences between results from national forest inventory and general management plan for different spatial levels. | Final proof. | A1, B9 |

### Grade evaluation=Passing the exam

| Evaluation elements | Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Lectures (L) | - | - | - | 15 | 0 | 0,5 |
| Exam (E) | 100% | 60-70% | Sufficient (2) | 0 | 45 | 1,5 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | **(Ex100)/100** | | **15** | **45** | **2** |

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

| Evaluation elements | Description | Deadline | Compensation |
|---|---|---|---|
| Lectures | Student presence is recorded. Maximum lecture absence of 20% is tolerated. | semester (15 hours of classes) | - |
| Written exam (We) | The exam comprises of 10 questions. To pass the exam student needs to achieve minimum of 60% of exam points. | exam schedule defined on the beginning of semester | - |
| Oral exam (Oe) | Requirement for approaching an oral exam is passed written exam within timeframe of registrated exam date Theoretical knowledge with subject understanding of lectured classes is checked. Final grade is calculated according to following formula (Wex50+Oex50)/100 | | |

# Clonal forestry

## Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Propose the applicable vegetative propagation method for a particular tree species.<br>To propose heterovegetative propagation techniques in the establishment of clonal seed orchards. Formulate a genetic variant of clones and transfer genetic covariantes.<br>Evaluate juvenile-adult correlation and clonal aging. | Seminar, final exam | B5, B13, B15, D1, D2 |
| Classify clonal material in genetic and physiological research. To predict the genetic parameters in clonal tests.<br>Choose the culture of soft and noble leaflets, mixed cultures, and / or clonal archives.<br>Analyze the existence of clone × site interaction (GEI) and perform clonal selection for general and specific adaptation and determine phenotype stability of clones.<br>Evaluate the existence of clone interactions and plant spacing, the influence of biotic and abiotic factors on the production of wood stock. | Seminar, final exam | B5, B13, B15, D1, D2 |
| Choose clonal cultures to protect waterways and polluted habitats (vegetation filters, phytoremediation, agroforestry).<br>Integrate the use of clonal material as forest reproductive material with legislation and legal regulation | Seminar, final exam | B5, B13, B15, D1, D2 |

**Grade evaluation=Passing the exam**

| Evaluation elements | Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Lectures (L) | - | - | - | 15 | 0 | 0,5 |
| Designing seminar papers (SP) | 20% | Satisfies with major corrections or upgrades. | Sufficient (2) | 0 | 15 | 0,5 |
| | | Satisfies with significant corrections and upgrades. | Good (3) | | | |
| | | Satisfies with minor corrections and upgrades. | Very good (4) | | | |
| | | Satisfies completely. | Excellent (5) | | | |
| Final exam (FE) | 80% | 60-70% | Sufficient (2) | 0 | 30 | 1 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | **(FEx80 + SPx20)/100** | | **15** | **45** | **2** |

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

| Evaluation elements | Description | Deadline | Compensation |
|---|---|---|---|
| Attendance of lectures | The attendance is checked and the attendance of the students is recorded. A student may justifiably be absent with a maximum of 15% of direct teaching hours. | semester (15 hours of direct lecturer) | - |
| Written seminar paper (SP) | In the first half of the semester, the student is given the topic of seminar paper, which the student prepares during the semester, and at the end of the semester submits the lecturer to the exam. If assessed positively, it is accepted as an elaborated seminar paper. | in accordance with the agreed terms | - |
| Written exam (FE) | Examinations can be attended by students who have completed exercises and preparation and positive evaluation of the seminar paper. The students in the printed exam answer the questions asked. The written exam is evaluated and participates in the final grade of the subject. The final grade is obtained according to the formula (FEx80 + SPx20)/100 | exam terms | - |

# Quantitative methods for planning in forestry

## Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Analyzing and solving mathematical problems based on learned mathematical concepts and modeling situations outside a mathematical context. | Participating in class problems, seminar paper, exam. | A3 |
| Connecting quantitative methods with engineering practice. | Participating in class problems, seminar paper, exam. | A3 |
| Using linear algebra to calculate the matrix inverse. | Participating in class problems, seminar paper, exam. | A3 |
| Solving a system of m linear equations with n unknowns. | Participating in class problems, seminar paper, exam. | A3 |
| Solving a constrained maximization or minimization problem. | Participating in class problems, seminar paper, exam. | B4, B13, B14 |
| Solving the transport problem. | Participating in class problems, seminar paper, exam. | B13, B14 |
| Reccomending a multiple-criteria method when making decisions in forestry. | Participating in class problems, seminar paper, exam. | B4, B13, B14, C1, C4 |
| Constructing a decision tree for a given problem. | Participating in class problems, seminar paper, exam. | B13, B14, C1, C4 |
| Recognizing situation types when making decisions. | Participating in class problems, seminar paper, exam. | C1, C2, C4 |

**Grade evaluation=Passing the exam**

| Evaluation elements | Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Lectures (L) | - | - | - | 13 | 9 | 0.75 |
| Seminar paper (S) | 50% | 50-59% | Sufficient (2) | 1 | 29 | 1 |
| | | 60-74% | Good (3) | | | |
| | | 75-89% | Very good (4) | | | |
| | | 90-100% | Excellent (5) | | | |
| Oral exam (O) | 50% | 50-59% | Sufficient (2) | 1 | 7 | 0.25 |
| | | 60-74% | Good (3) | | | |
| | | 75-89% | Very good (4) | | | |
| | | 90-100% | Excellent (5) | | | |
| **UKUPNO** | **100%** | **S+O** | | **15** | **45** | **2** |

| Evaluation elements | Maximum points or Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Final exam* (FE) | | 50-59%<br>60-74%<br>75-89%<br>90-100% | Sufficient (2)<br>Good (3)<br>Very good (4)<br>Excellent (5) | | | 1.25 |
| **UKUPNO** | **100%** | **FE** | | | | |

***students who do not pass the course during the semester can take the exam during exam terms. The exam consists of a written and oral part. Students need to achieve at least 50% on**

**the written part in order to take the oral part of the exam. The written part of the exam can be replaced with a seminar paper.**

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

| Evaluation elements | Description | Deadline | Compensation |
|---|---|---|---|
| Lecture attendance | Attendance is checked during class. Attendance and participation are necessary for obtaining the lecturer's signature, producing a seminar paper and taking exams. | semester (15 hours of direct lectures) | - |
| Seminar paper | Students apply methods taught in lectures to a practical problem that is presented in written form. | week 10 | - |
| Oral exam | The exam includes topics from the seminar paper and related coursework. | week 15 | 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 or handed in the seminar paper can take the oral exam. The final grade is obtained by combining the results of the written and oral exams. | exam terms | - |

# Hunting cinology

### Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Present hunting kinology - historical development and organization (development of kinology - organization of the World Kinologist Organization - FCI and Croatian Kinesiological Association - HKS). | Final exam. | A1, C4, D1 |
| Identify anatomy and morphology of hunting dogs (Anatomy, disadvantages of body and teeth appearance, breeding of dogs, dog diseases, procurement, keeping and schooling of dogs). | Final exam. | A1, C4, D1 |
| Present groups and standards, and tests of hunting dogs (groups of dogs by the standards of the FCI - Pointers, retrievers, dahhounds, ect.). | Final exam. | A1, C4, D2 |

### Grade evaluation=Passing the exam

| 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 | 15 | 1 |
| Exam (E) | 100% | 60-70% | Sufficient (2) | 0 | 30 | 1 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | **(L+Ex100)/100** | | **15** | **45** | **2** |

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

| Evaluation elements | Description | Deadline | Compensation |
|---|---|---|---|
| Attendance of lectures and exercise | 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. (FEx100)/100 | exam terms | - |

# Mechanization in forest silviculture

## Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Compare agricultural tractors in mechanized silvicultural works (technical features of tractors, classification, transmission, construction features, requirements of ISO and OECD standards for agricultural tractors). | Written exam. | B10 |
| Analyze mechanized works in forest seed processing and nursery production of forest seedlings (machines for seed extraction and dewinging, machines and tools in nursery production of forest seedlings). | Written exam. | B10 |
| Present mechanized works of habitat preparation, afforestation, tending of stands, forest cultures and plantations, short rotation coppice (machinery and tools in habitat preparation, machinery and devices in forest tending, machinery and devices for establishing and tending of forest cultures and plantations, specialized machinery and tools for short rotation coppice harvesting and storage of wood biomass). | Written exam. | B10 |

## Grade evaluation=Passing the exam

| Evaluation elements | Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Lectures (L) | - | - | - | 15 | 0 | 0,5 |
| Exam (E) | 100% | 60-70% | Sufficient (2) | | | |
| | | 71-80% | Good (3) | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | 81-90% | Very good (4) | 0 | 45 | 1,5 |
| | | 91-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | **(Ex100)/100** | | **15** | **45** | **2** |

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

| Evaluation elements | Description | Deadline | Compensation |
|---|---|---|---|
| Attendance of lectures | The attendance is checked and the attendance of the students is recorded. A student may justifiably be absent with a maximum of 20% of direct teaching hours. | semester (15 hours of direct lecturer) | - |
| Written exam | Students lay inly written exam. The students in the printed exam answer the questions asked. The written exam is evaluated and represents the final grade of the subject. | exam terms | - |

# Legislative and regulative for forest management planning

## Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Present National forestry policy and strategy: importance, strategic areas, goals and priorities, implementation concept - carriers, timelines, financing (National forestry program goals and tasks, forestry policies in Croatia trough National environmental protection program (NEAP) Biodiversity (NSAP), Forestry measures, Forestry certification). | Knowledge test, final exam. | A1, A2, D3 |
| Define organization of forestry administration in Croatia - ministry, regional offices, inspection service (key actors in forestry sector, forest law in Croatia, EU guidelines and national subordinate regulations). | Partial test, knowledge test, final exam. | A1, A2, D3 |
| Analyse forestry policy in Croatia in EU context (Europe 2020 as a strategic framework for balanced EU development, EU cohesion policy, the principle of programming, the RH rural development program, principles and criteria project applications and allocation of funds by measures). | Knowledge test, final exam. | A1, A2, D3 |

## Grade evaluation=Passing the exam

| 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 |
| Partial exam from Legislation (K2) | 15% | 60-70% | Sufficient (2) | 0 | 15 | 0,5 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Final exam (FE) | 85% | 60-70% | Sufficient (2) | 0 | 30 | 1 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | **(K2x15+FEx85)/100** | | **15** | **45** | **2** |

| **Evaluation elements** | **Maximum points or Share in evaluation** | **Grade rating scale** | **Grade** | **Direct teaching hours** | **Number of average students workload outside the direct teaching** | **ECTS** |
|---|---|---|---|---|---|---|
| Final exam (FE) | | 60-70% | Sufficient (2) | | | 1,5 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | **(K2x15+FEx85)/100** | | | | |

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

| **Evaluation elements** | **Description** | **Deadline** | **Compensation** |
|---|---|---|---|
| Attendance of lectures and exercise | The attendance is checked and recorded. A student may justifiably be absent with a maximum of 15% of direct teaching hours. | semester (15 hours of direct lecturer) | - |
| Partial exam | Students in the pre-printed exam answer questions answered, round off accurate answers and supplement the words within the sentence. The colloquia is evaluated and participates in the final grade of the subject. | 10. week | Students who pass the partial exam can access the exam. |

| | | | |
|---|---|---|---|
| Written exam | Examinations can be attended by students who have exercises and a colloquy. The students in the pre-printed exam fit the questions asked, completing the correct answers. The written exam is evaluated and participates in the final grade of the subject. | exam terms | - |
| Oral exam | Students who pass a written exam are asked questions from different parts of program content. Final grade of subject is obtained according to the formula.<br>(K2x15+FEx85)/100 | | |

# Communication and certification processes in forestry

## Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Present forestry activities and improve public relations through positive messages (preservation of Natura 2000, contribution to rural development, reduction of the impact of climate change, etc.) | Knowledge tests, final exam. | A1, A2, D3, D5 |
| Factually analyze current topics and argue the attitudes of the forestry profession towards target groups and the public | Preliminary exam, knowledge tests, final exam. | A1, A2, D3, D5 |
| Present to a third party the role and importance of forestry in global processes related to the bioeconomy, the 'green' economy, green jobs, the RED I Directive and the FLEGT action plan | Knowledge tests, final exam. | A1, A2, D3, D5 |
| Present the idea and concept, direct and indirect benefits of forest certification and ecological certification od product | Knowledge tests, final exam. | A1, A2, D3, D5 |

## Grade evaluation=Passing the exam

| 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 |
| Partial exam from Legislation (K2) | 15% | | Sufficient (2) | 0 | 15 | 0.5 |
| | | | Good (3) | | | |
| | | | Very good (4) | | | |
| | | | Excellent (5) | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Exam (E) | 85% | 60-70% | Sufficient (2) | 0 | 30 | 1 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | **(K2x15 + Ex85)/100** | | **15** | **45** | **2** |

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

| Evaluation elements | Description | Deadline | Compensation |
|---|---|---|---|
| Attendance of lectures and seminars | Checking and evidence of students attendance. Student is allowed exculpatory to absent of maximal 15% hours of direct teaching. | semester (15 hours of direct teaching) | - |
| Partial exam from Legislation (K) | Students in the pre-printed exam answer questions answered, round off accurate answers and supplement the words within the sentence. The partial exam is evaluated and participates in the final grade of the subject Students who pass the partial exam can access the final exam | 10. week | |
| 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 K2x15+Ex85/100 | | |

# Dendrochronology

### Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Acquiring knowledge required for proper increment core sampling, preparation, measurement and analysis. | Final exam | A1 |
| Construction and interpretation of reference tree ring chronology. | Final exam | B4 |
| Interpretation and comparison of own results with results in other fields and report creation. | Final exam | B9, D4, D5 |

### Grade evaluation=Passing the exam

| Evaluation elements | Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Lectures (L) | - | - | - | 15 | | 0,5 |
| Exam (E) | 100% | 60-70% | Sufficient (2) | 0 | 45 | 1,5 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | **(Ex100)/100** | | **15** | **45** | **2** |

# European forestry

### Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Present the silvigeographic features of European forests. | Seminar, final exam. | A2 |
| Present the main methods of forest management in Europe. | Seminar, final exam. | A2 |
| Link the history of land use with forest management methods. | Seminar, final exam. | A2 |
| Valorize adaptations of silviculture in the conditions of climate change and natural disasters. | Seminar, final exam. | A2 |
| Valorize the role of close to nature forestry and nature protection requirements. | Seminar, final exam. | A2 |
| Evaluate the economic and public interest of European forests. | Seminar, final exam. | A2 |

### Grade evaluation=Passing the exam

| Evaluation elements | Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Lectures (L) | - | | | 15 | 0 | 0,5 |
| Exam (E) | 100% | 60-70% | Sufficient (2) | 0 | 45 | 1,5 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | **(Ex100)/100** | | **15** | **45** | **2** |

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

| Evaluation elements | Description | Deadline | Compensation |
|---|---|---|---|
| Attendance of lectures | 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 lectures) | - |
| Seminar paper | Writing a seminar paper on the topic of forestry in one of the European countries. | - | - |
| Oral exam | Students are asked questions from different parts of the program content. | exam terms | - |

# Silviculture of special purpose forests

## Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Specifically forested forests, urban forests and arboriculture (raising forests of special purpose, restoration of special purpose forests, urban forestry functions, differences between urban forestry and arboriculture). | Practicum, Preliminary exam, Final exam | A2, B4 |
| Compare the assessment of dangerous trees using different methods (identifying dangerous trees (basics of static trees, fracture profiles of different tree species) and protection measures. | Practicum, Preliminary exam, Final exam | B4, B8 |
| Present the production of trees and large tree trunks (biological-ecological requirements of species, problems of large trees, extraction and packaging). | Practicum, Preliminary exam, Final exam | B15 |
| Establish the establishment and care of a tree (choice of species, appearance, care). | Practicum, Preliminary exam, Final exam | B4, B15 |
| Analyze the establishment and breeding of plantations in degraded habitats (establishment of plantations in arid and semiarid areas, selection of planting species in the Mediterranean area). | Practicum, Preliminary exam, Final exam | B4, B5, B6 |
| Present the establishment and cultivation of special forestry plants (short-term plantations for the production of forest biomass, windshield belts, agro-forestry, Christmas trees). | Practicum, Preliminary exam, Final exam | B4, B5, B11, B15 |

**Grade evaluation=Passing the exam**

| 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) | - | - | - | 15 | 6 | 0,7 |
| Field work (FW) | - | - | - | 16 | 2 | 0,6 |
| 1. Partial exam (PE1) | 50% | 60-70% | Sufficient (2) | 0 | 42 | 1,4 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| 2. Partial exam (PE2) | 50% | 60-70% | Sufficient (2) | 0 | 39 | 1,3 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | **(P+V+TN+K1x50+K2x50)/100** | | **61** | **89** | **5** |

| 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 % | 60-70%<br>71-80%<br>81-90%<br>91-100% | Sufficient (2)<br>Good (3)<br>Very good (4)<br>Excellent (5 | - | 81 | 2,7 |
| **TOTAL** | **100%** | **(ZIx100)/100** | | | | |
| *** 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** | | | | | | |

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

| Evaluation elements | Description | Deadline | Compensation |
|---|---|---|---|
| Lectures (L) | 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 (30 hours of direct lectures) | - |
| Exercises (E) | 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 (FW) | On-site teaching is checked and the presence of students is recorded and no absences allowed. After completing each field course, the students are obliged to write and submit a report from the field teaching. | according to the field curriculum | - |

| | | | |
|---|---|---|---|
| 1. Partial exam (PE1) | 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 a written test with 20 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. It is necessary to collect more than 60% points for the passage to the colloquium. | 8. week | There is a possibility of a correction deadline for the colloquium. |
| 2. Partial exam (PE2) | 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 a written test with 20 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. It is necessary to collect more than 60% points for the passage to the colloquium.<br><br>Students who get enough points from both hands get the final grade from the subject that is the arithmetic mean of the score from the first and second rounds. | 15. week | There is a possibility of a correction deadline for the colloquium. |
| Written exam | Written exam consists of 20 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, it is necessary to collect more than 60% of the points. | exam terms | - |
| Oral exam | The requirement for the oral part of the exam is sufficient number of points collected on the written part of the exam.<br>The final grade is obtained according to the formula (ZIx100)/100 | | - |

# Economics of forest company

### Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| To analyse capital and investments in forestry (meaning of the capital in forestry, fixed property and working capital in forestry, categories and importance of investments in forestry). | Excersise, final exam | C1 |
| To present costs, calculation and cost management in forestry (costs in production processes, types and methodes of calculation, price structure in creation of specific calculation for characteristic productions and forest products). | Excersise, final exam | C3, B12 |
| To compare economic analyse of bussiness performance in forest company and business indicators (balance sheet, profit and loss account, cash flow, debt ratio, liquidity, activity, profitability, investment and market value). | Excersise, final exam | C3 |
| To estimate specifics of planning processes and business plan (economic statements, influence of forest management planning on business results, functioning of investemnts and business plans in forest management, goals, contents and shape of the business plan). | Excersise, final exam | B1, B12, C3 |
| To compare economic policy insstruments and processes of strategic planning (monetary system, fiskal system, overseas relations and income policy, environmety analyses, added value chain analyse, controlling instruments). | Excersise, final exam | B1, C4 |

**Grade evaluation=Passing the exam**

| Evaluation elements | Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Lectures (P) | 10% | Minimal number of attendance in the class. | Sufficient (2) | 30 | 0 | 1 |
| | | | Good (3) | | | |
| | | | Very good (4) | | | |
| | | Attendance and active participation in the teaching during semester. | Excellent (5) | | | |
| Excercizes (V) | 30% | | Sufficient (2) | 15 | 30 | 1,5 |
| | | | Good (3) | | | |
| | | | Very good (4) | | | |
| | | Regular submission of excersize tasks without corrections. | Excellent (5) | | | |
| Field work | 10% | 60-70% | Sufficient (2) | 8 | 7 | 0,5 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| Midterm exam I | 25% | 60-70% | Sufficient (2) | | 15 | 0,5 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| Midterm exam II | 25% | 60-70% | Sufficient (2) | | 15 | 0,5 |
| | | 71-80% | Good (3) | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| Written exam | 50% | 60-70% | Sufficient (2) | 0 | 30 | 1 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| **Total** | **100%** | **(Px10+Vx30 + K1x30+K2x30)/100** | | **53** | **67** | **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 points** |
|---|---|---|---|---|---|---|
| Final exam (FE) | 50 % | 60-70% | Sufficient (2) | 30 | | 1 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | **(FExy0+Exy0)/100** | | | | **4** |

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

| Evaluation elements | Description | Deadline | Compensation |
|---|---|---|---|
| Attendance of lectures and exercise | Checking the attendance of students on lectures. Student can miss the lectures justifies more than 15% of exercises. | Semester (45 hours of direct lecturer) | - |
| Excercise | Excersies are individual. Students are receiveng excercise 97emplate sin the beginning of the course, and shape of the folder and files, which will be used for the individual tasks. Accuracy, precision and regularity of assignment are evaluating. | 15. week | |
| Written exam | Students could attend exam with succesfully and correct finished exercises. Students on printed written exam work on three calculation exams. One positive exam has 10 points. Half of the correct exam gain 5 points. Grades for written exam are: 15-sufficient (2), 20- good (3), 25-very good (4), 30-excellent (5) | exam terms | |
| Midterm exam I | Checking fo achievement learning otcomes C1, C3 in relation with investment analyse. | Week 9 | |
| Midterm exam II | Checking fo achievement learning otcomes B1, B12, C3 in relation with business planning in forestry. | Week 15 | |
| 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:<br>Sufficient (2) 60%, Good (3) 71%, Very good (4) 81%, Excellent (5) 91% | | |

# Hunting management II

### Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Present game breeding in a fenced area (reasons, advantages and lack of intensive game breeding, facilities and equipment in wildlife farms).areas, habitat quality for large and small game, determining the hunting capacity for each species of game). | Practice exercises, final exam. | A1, B2 |
| Identify the breeding technology of a certain species of game in a fenced area | Practice exercises, final exam. | A1, B2 |
| Organize hygiene and health care in the breeding grounds (preventive, curative and remedial measures of health care, equipment, handling of game meat). | Practice exercises, final exam. | A1, C2 |
| Review the economics and marketing of wild game breeding in a fenced area (economic justification, calculation of income and expenditure of game farms, marketing of farms, products and services). | Practice exercises, final exam. | B2, C2, D2 |
| To predict the entry of wild game from breeding into open hunting grounds (procedure for entry of game from game farms into open hunting grounds - drift, preparation of habitat, reception site, discharge procedure, release time). | Practice exercises, final exam. | B2, C2, D2 |

**Grade evaluation=Passing the exam**

| 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) | - | - | - | 60 | 0 | 2,0 |
| Field work | - | - | - | 16 | 0 | 0,5 |
| Exam (E) | 100% | 60-70% | Sufficient (2) | 0 | 44 | 1,5 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | **(L+E+FW+Pex100)/100** | | **106** | **44** | **5** |

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

| Evaluation elements | Description | Deadline | Compensation |
|---|---|---|---|
| Attendance of lectures and exercise | Checks and records attendance of students. A student may justifiably be absent with a maximum of 15% of direct teaching hours. | semester (45 hours of direct lecturer) | - |
| Exercise | Exercises 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. Exercises 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 exercises. 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.<br>The final grade is obtained according to the formula(FEx100)/100 | exam terms | - |

# Forestry Techniques and Technologies

## Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Recommend machines for tree felling and processing and timber transport (chainsaw, harvester, skidder, adapted farming tractor, forwarder, forest trucks for timber transport, cableways). | Colloquium, Final exam | B10 |
| Present timber harvesting works, development of standardization and rationalization of timber harvesting (timber harvesting systems and sub-systems, works required for the production of a particular forest product, standardization of forest products by processing methods, skidding or forwarding technology, new technical and technological method of timber harvesting, standardizing of harvesting works by applying work and time studies, rationalization of works). | Colloquium, Final exam | B10 |
| Investigate the construction and maintenance of forest roads in the lowland area and on sloping terrains (the procedures for establishing an optimal network of forest roads in the field are considered through the issues of construction and maintenance in the lowland area and on sloping terrain, the analysis of the existing primary and secondary forest traffic infrastructure network). | Colloquium, Final exam | B10 |
| Present a modern approach to optimizing the network of forest roads - revitalization of land (justifiability of return on land, land revitalization, so-called reforestation, existing techniques and technologies for land revitalization). | Colloquium, Final exam | B10 |

**Grade evaluation=Passing the exam**

| 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 |
| Field work | | | | 24 | 0 | 0.5 |
| Exercises (E) | | | | 30 | 20 | 1.25 |
| Partial exam I (Mechanization) | 33.3% | 60-70% | Sufficient (2) | 0 | 20 | 0.75 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| Partial exam II (Timber harvesting) | 33.3% | 60-70% | Sufficient (2) | 0 | 20 | 0.75 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| Partial exam III (Forest roads) | 33.3% | 60-70% | Sufficient (2) | 0 | 20 | 0.75 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | **(PEIx33.3+PEIIx33.3+PEIIIx33.3)/100** | | **84** | **80** | **5** |

| Evaluation elements | Maximum points or Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS bodovi |
|---|---|---|---|---|---|---|
| Final exam (FE) | 70 % | 60-70%<br>71-80%<br>81-90%<br>91-100% | Sufficient (2)<br>Good (3)<br>Very good (4)<br>Excellent (5) | | 60 | 2.25 |
| **TOTAL** | **100%** | | | | | |
| *** students who do not pass the colloquium during the semester take the written and oral exam during the exam period.** | | | | | | |

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

| Evaluation elements | Description | Deadline | Compensation |
|---|---|---|---|
| Attendance of lectures, exercise 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 15% of other types of direct teaching hours (lecturers and calculation exercises). | semester (84 hours of direct lecturer) | - |
| Exercises preparation | Exercises are attended by groups. At the beginning of the first exercise, students will receive templates with exercise assignments, in which they will respond to the set tasks in printed form. | in accordance with the agreed terms | |
| Partial exam I | Partial exam I can be accessed by students with checked exercises of the first third of the class. The achievement of the 1st learning outcome is checked. | 5th week | |
| Partial exam II | Partial exam II can be accessed by students with checked exercises of the second third of the class. The achievement of the 2nd learning outcome is checked. | 10th week | |

| | | | |
|---|---|---|---|
| Partial exam III | Partial exam III can be accessed by students with checked exercises of the last third of the class. The achievement of the 3rd and 4th learning outcome is checked. | 15th week | |
| Written exam (WE) | Examinations can be attended by students who have completed exercises and field teaching but did not pass the partial exams. Also, students who are not satisfied with the final grade on the basis of passed partial exams can access the written exam. 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 (OE) | Students who pass a written exam are asked questions from different parts of the program content. The final grade is calculated according to formula: (WEx30+OEx70)/100 | exam terms | |

# Forest Karst Meliorations

### Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Assess the role and meaning of the karst ecosystem (melioration works, ecological requirements and silvicultural treatment characteristics of the pioneer species). | Partial exam , seminars, final exam. | B6 |
| Present the problem of erosion and torrents on karst, and degraded amelioration forest terrain (causes and consequences of erosion processes and torrents, ways reconstruction, raising of wind and rain protection belts at karst, meliorative factors of forest vegetation on karst). | Partial exam, seminars, final exam. | B6 |
| Predict the renewal of forest vegetation after open space fire (issues of open space fire and impact on forest vegetation, protection measures). | Partial exam, seminars, final exam. | B5 |

### Grade evaluation=Passing the exam

| Evaluation elements | Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Lectures (L) + Exercises (E) + Field work | - | - | - | 45 | - | 1,5 |
| Seminar work (Sw) | 10% | 50-70% | Sufficient (2) | - | 10 | 1,0 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Partial exam (P1) | 45% | 50-70% | Sufficient (2) | - | 20 | 1,25 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| Partial exam (P2) | 45% | 50-70% | Sufficient (2) | - | 20 | 1,25 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | **(Ex10+ P1x45 + P2x45)/100** | | **45** | **50** | **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 points** |
|---|---|---|---|---|---|---|
| Final exam (FE) | 90 % | 50-70% | Sufficient (2) | | 40 | 2,5 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | **(Fex90+Swx10)/100** | | | | |

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

| Evaluation elements | Description | Deadline | Compensation |
|---|---|---|---|
| Attendance of lectures and exercise + field work | 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 + 2 field days) | - |
| Creating a seminar paper on exercises | Seminar papers are prepared in accordance with the assigned topics related to the analysis and interpretion of the teaching units in the exercises. | According to the agreed time | 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 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: (Fex90+Swx10)/100 | | - |

# Spatio-temporal analysis in GIS

## Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Pronounce the definition of spatial data. Distinguish ordinary from spatial information. Describe models and sources of spatial data. Comment on the types and form of spatial data. | Comprehensive exam | D4 |
| Pronounce the definition of digital relief model and digital orthophoto. Describe and explain ways of making and editing data at creating DRM. Present the creation of a DRM and explain its significance in forestry. Compare ways of DRM visualization. | Comprehensive exam | A1, B2, B9, B15, D4 |
| Compare and describe the analysis of vector and raster data.<br>Analyze isolated polygons with aim of determining the homogeneity and / or heterogeneity of the studied area from the aspect of silviculture, forest management, forest protection, ... | Comprehensive exam | A1, B2, B9, B15, D4 |
| Analyze quantification of spatial elements of land use, land cover and habitat. Explain the significance of spatial analysis and valorization of spatial elements. | Comprehensive exam | A1, B2, B9, B15, D4 |

## Grade evaluation=Passing the exam

| 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 |
| Comprehensive exam (CE) | 100% | 60-70% | Sufficient (2) | 7,5 | 37,5 | 1,5 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| **UKUPNO** | **100%** | **(CEx100)/100** | | **22,5** | **37,5** | **2** |

**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 (15 hours of direct lecturer) | The student work off for absence from the individual lectures term. |
| Regular examination deadlines | All students who have fulfilled their teaching obligations have the right to attend a regular exam period. The knowledge of the entire program (realized through theoretical lectures) is checked on the exam. | published examination deadlines | - |

# Bioenergy plantations and phytoremediation

## Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Students are familiar with the types of forest trees suitable for short rotation crops, with energy potential and wood biomass production in Short Rotation Forestry (SRF). The clone / site interaction and the spacing of planting, as well as the influence of habitat, biotic and abiotic factors. Monoclonal vs. multiclonal cultures of forest trees, optimum number of clones in the SRF, distribution of clones in bioenergy cultures, interaction of clone × habitat (GEI) | Seminar, final exam | B5, B13, B15, D1, D2 |
| The ecological and physiological aspects of the SRF (competition, dynamics of regeneration, regeneration, physiological stress, replenishment etc.), Cultures and plantations of forest trees, mixed crops, bioenergetic plants, agroforestry, plantations in watercourse protection, vegetation filters, remediation of contaminated surfaces (phytoremediation) , carbon sequestration, the use of wastewaters and recovery deposits in the CLC. Principle of the effect of fodder mediation (phytoextraction, rhizofiltration, phytostation, phytodegradation, rhodium degradation, phytovolatilization). | Seminar, final exam | B5, B13, B15, D1, D2 |
| Biodiversity and Environmental Protection Contribution to Short Rotation Forestry and Fertilization (Greenhouse Gases, Energy Balance, Biomass Conversion in Energy, Use of Cocoa in Reducing Pollution, Biomass Characteristics as Fuel, Improvement of Soil Properties, etc.), Socio-Economic Position a legislative environment for biomass production and phytoremediation. | Seminar, final exam | B5, B13, B15, D1, D2 |

**Grade evaluation=Passing the exam**

| Evaluation elements | Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Lectures (L) | - | - | - | 15 | 0 | 0,5 |
| Designing seminar papers (SP) | 20% | Satisfies with major corrections or upgrades. | Sufficient (2) | 0 | 15 | 0,5 |
| | | Satisfies with significant corrections and upgrades. | Good (3) | | | |
| | | Satisfies with minor corrections and upgrades. | Very good (4) | | | |
| | | Satisfies completely. | Excellent (5) | | | |
| Final exam (FE) | 80% | 60-70% | Sufficient (2) | 0 | 30 | 1 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | **(FEx80 + SPx20)/100** | | **15** | **45** | **2** |

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

| Evaluation elements | Description | Deadline | Compensation |
|---|---|---|---|
| Attendance of lectures | The attendance is checked and the attendance of the students is recorded. A student may justifiably be absent with a maximum of 15% of direct teaching hours. | semester (15 hours of direct lecturer) | - |

| | | | |
|---|---|---|---|
| Written seminar paper (SP) | In the first half of the semester, the student is given the topic of seminar paper, which the student prepares during the semester, and at the end of the semester submits the lecturer to the exam. If assessed positively, it is accepted as an elaborated seminar paper. | in accordance with the agreed terms | - |
| Written exam (FE) | Examinations can be attended by students who have completed exercises and preparation and positive evaluation of the seminar paper. The students in the printed exam answer the questions asked. The written exam is evaluated and participates in the final grade of the subject. The final grade is obtained according to the formula (FEx80 + SPx20)/100 | exam terms | - |

# Ecology of Forest Tree Species

## Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Identify tree species on the basis of morphological features, identify tree parts and shapes, and apply theoretical and practical knowledge of economically important indigenous and alohton species of trees and shrubs. | Tests of knowledge, oral exam. | B1 |
| Conduct biological and technical works on park and green landscaping. | Tests of knowledge, oral exam. | B4 |
| Conduct professional field work on plant protection in urban areas. | Tests of knowledge, oral exam. | B7 |
| Conduct environmental monitoring. | Tests of knowledge, oral exam. | C1 |

## Grade evaluation=Passing the exam

| Evaluation elements | Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Lectures (L) attendance | 10% | 100%<br>90%<br>80%<br>70% | Excellent (5)<br>Very good (4)<br>Good (3)<br>Sufficient (2) | 15 | 0 | 0.5 |
| Partial exam (PE) | 45% | 50%-62% | Sufficient (2) | 4 | 26 | 1 |
| | | 63%-76% | Good (3) | | | |
| | | 77%-90% | Very good (4) | | | |
| | | 91%-100% | Excellent (5) | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Oral exam (OE) | 45% | 50%-62% | Sufficient (2) | 1 | 14 | 0.5 |
| | | 63%-76% | Good (3) | | | |
| | | 77%-90% | Very good (4) | | | |
| | | 91%-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | **(Lx0,1)+(PEx0,45)+(OEx0,45)** | | **20** | **40** | **2** |

**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. The student can reasonably be absent from a maximum of 30% lectures. Attendance is evaluated by grades 2-5, and this grade is taken when calculating the final grade of the subject. | semester (15 hours of direct lecturer) | Exceptionally, in the case of a justified reason the student should compensate for the lack of individual lectures. |
| 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 grade of the subject. | exam terms | The student has the right three times to go to the exam. |
| Oral exame | Students who pass a written test and who receive passive grades from lectures 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: (Lx0,1)+(PEx0,45)+(OEx0,45) | exam terms | The student has the right three times to go to the exam. |

# Population outbreaks and monitoring of forest insects

## Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Identify the dynamic processes that rule in the insect populations, identify the dominant mechanisms that govern and interpret the circumstances that lead to overburdening and collapsing populations on the other side. | Seminar, final exam. | B4, B8, C6 |
| Differentiate and classify different population-gradation types according to their grading properties and predict the grading process on the basis of recognized patterns. | Seminar, final exam. | B4, B8, C6 |
| To explain concrete historical examples of forest insect gradation based on the circumstances that led to them. | Seminar, final exam. | B4, B8, C6 |
| Link recent and potential future gradations with biotic and abiotic factors that are crucial to their emergence. | Seminar, final exam. | B4, B8, C6 |
| Calculate the actual and relative density of a specific forest insect population using the data collected through the monitoring system. | Seminar, final exam. | B4, B8, C6 |
| To know and evaluate the risks of the outbreak of the most important forest insect pests on the basis of the analyzed input parameters and patterns that define the population dynamics of the analyzed pests. | Seminar, final exam. | B4, B8, C6 |

**Grade evaluation=Passing the exam**

| 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% | | | 15 | 0 | 1 |
| Seminar (S) | 50% | Student through the seminar handles the default problem / topic. | Sufficient (2)<br>Good (3)<br>Very good (4)<br>Excellent (5) | 0 | 20 | 0,67 |
| Final exam (FE) | 50% | 65-74%<br>75-84%<br>85-94%<br>95-100% | Sufficient (2)<br>Good (3)<br>Very good (4)<br>Excellent (5) | 0 | 25 | 0,83 |
| **TOTAL** | **100%** | **(S1x50 + Fex50)/100** | | **15** | **45** | **2** |

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

| Evaluation elements | Description | Deadline | Compensation |
|---|---|---|---|
| Attendance of lectures | The attendance is checked and the attendance of the students is recorded. A student may justifiably be absent with a maximum of 15% of direct teaching hours | semester (15 hours of direct lecturer) | - |
| Seminar (S) | In the form of a seminar presentation / presentation, the student demonstrates the knowledge learned from the forestry insect codes and their monitoring system (according to the program). Structured exposes the problem of the default pest. | the second third semester | No compensation. |
| Final exam | Students who exhibit and evaluate their seminar and fulfill their student obligations (attendance) get the right to go to final exam Final grade is the result of a combination of a seminar evaluation and an oral final exam.<br>On the final exam can equally come out and a student who did not give up seminar. | regular and extraordinary examination deadlines | |

# Fire Management and Restoration

## Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Identify the basic features and characteristics of the fire. Identifying areas where fires occur more frequently. Grading of forest fuel. | Final exam | B8 |
| Understanding fire-fighting activities. Analyzing the ways and forms of risk assessment. Evaluation of the model for assessing the vulnerability. | Final exam | B8 |
| Understanding qualitative and quantitative forms of damage. Analyze types suitable for reconstruction. Evaluation of the restoration methods. | Final exam | B6 |

## Grade evaluation=Passing the exam

| Evaluation elements | Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Lectures (L) | | | | 11 | 0 | 0,3 |
| Seminar (S) | 20% | 50-70% | Sufficient (2) | 2 | 10 | 0,4 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| Partial exam (P1) | 40% | 50-70% | Sufficient (2) | 1 | 20 | 0,7 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | 91-100% | Excellent (5) | | | |
| Partial exam (P2) | 40% | 50-70% | Sufficient (2) | 1 | 20 | 0,7 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | **(Sx20 + P1x40 + P2x40)/100** | | **15** | **50** | **2** |

| Evaluation elements | Maximum points or Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS points |
|---|---|---|---|---|---|---|
| Final exam (FE) | 80 % | 50-70%<br>71-80%<br>81-90%<br>91-100% | Sufficient (2)<br>Good (3)<br>Very good (4)<br>Excellent (5) | | 42 | 1,4 |
| **TOTAL** | **100%** | **(Fex80+Sx20)/100** | | | | |

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

| Evaluation elements | Description | Deadline | Compensation |
|---|---|---|---|
| Attendance of lectures | The attendance is checked and the attendance of the students is recorded. A student may justifiably be absent with a maximum of 15% of direct teaching hours. 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:<br>(Fex80+Sx20)/100 | | |

# Preparation and Measurement of Hunting Trophies

## Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Managing and autonomous making decision in wildlife/game management | Oral exam | B4 |

## Grade evaluation=Passing the exam

| Evaluation elements | Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Lectures (L) | 0% | | | 15 | 0 | 0,5 |
| Exam (E) | 100% | 60-70% | Sufficient (2) | 0 | 45 | 1,5 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | **(Ex100)/100** | | **15** | **45** | **2** |

**Detailed description of evaluation elements for lecturer, excercises, 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 (15 hours of direct lecturer) | - |
| Written exam | Written exam must be positively graded (2-5) so the student may participate in oral exam, according to Croatian Hunting Act. | exam terms | |
| Oral exam | Asks from different parts of course content. | exam terms | |

# Floodplain forests

## Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Present the geomorphology of floodplain and habitat for floodplain forest (lowland forests, floodplain forest, riparian forest, floodplain area, floodplain site, floodplain geomorphology and fluvial processes). | Final exam. | B5 |
| Define geography, morphology and dynamics of floodplain forests (distribution, types, biodiversity and flood forest dynamics). | Final exam. | B5 |
| Recommend the management of floodplain forests (production, economic, ecological and social values, silvicultural procedures). | Final exam. | B5 |
| Present threats and revitalization of flood forest (impact of intervention in environment for floodplain forest, conservation and revitalization of floodplain forests). | Final exam. | B5 |

## Grade evaluation=Passing the exam

| 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 |
| Final exam (FE) | 100% | 60-70% | Sufficient (2) | | 45 | 1,5 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| **UKUPNO** | **100%** | **(FEx100)/100** | | **15** | **45** | **2** |

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

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

# Management by selection system and subalpine forest ecosystems

## Learning outcomes and evaluation methods

| Learning outcomes (IU) | Evaluation methods | Connection with the study program IU |
|---|---|---|
| Explain the division of the subalpine ecosystem and the forest community. Conduct the renovation of subalpine forest communities. Apply knowledge of ecology and stability of subalpine forest communities. | Final exam. | B1, B2, B3 |
| Apply knowledge of selection system management methods, especially in subalpine forest ecosystems. | Final exam. | B2, B3 |
| To perfect the existing and introduce new techniques of selection system management. Apply knowledge of selection system management of beech stands and other types of trees. | Final exam. | B15 |

## Grade evaluation=Passing the exam

| 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 | 15 | 1,0 |
| Seminar (S) | - | - | - | 0 | 15 | 0,5 |
| Final exam (FE) | 100% | 60-70% | sufficient (2) | 0 | 15 | 0,5 |
| | | 71-80% | good (3) | | | |
| | | 81-90% | very good (4) | | | |
| | | 91-100% | excellent (5) | | | |
| **TOTAL** | **100%** | **(FEx100)/100** | | **15** | **45** | **2** |

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

| Evaluation elements | Description | Deadline | Compensation |
|---|---|---|---|
| Lectures (L) | The lectures are checked and the presence of students is recorded. Students may be excluded with a maximum of 20% of direct teaching hours. | semester (15 hours of direct teaching) | - |
| Seminar (S) | Writing of seminar work from problems of selection system management in subalpine forest ecosystems. | - | - |
| Written exam (WE) | After completing a lecture, students take a written exam. The final grade of the subject is obtained according to the formula (FEx100)/100 | according to the test schedule | - |

# Remediation of degraded land

## Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Identify the most important forms of lands degradation. Present the most suitable remediation methods for a specific case. | Full examination. | A2 |
| To predict the development of erosion processes. Recommend appropriate preventative anti-erosion measures. Establish measures for remediation of eroded lands. | Full examination. | B4 |
| Select and apply the corresponding recovery methods for acidity or alkalinity soils. | Full examination. | B4 |
| Analyze the specifics of surface mining for the apply of remediation measures. Select corresponding soil remediation method. | Full examination. | B4 |
| Determine a degradation processes as a result of petroleum mining. Preventive measures for the progression of degradation. | Full examination. | B4 |
| The landfill classification. Recommend the optimal method for remediation a landfill. | Full examination. | B4 |
| Select plant species for a degraded land remediation project. | Full examination. | B4 |
| Assess the nature of forest habitat degradation. Biological remediation of fire site. | Full examination. | B4, B7 |
| Evaluate the causes of individual or massive drying of trees in the stand. Appropriate technical and biological measures of land remediation. | Full examination. | B4, B7 |

**Grade evaluation=Passing the exam**

| 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 | 3 | 0,6 |
| Exam (E) | 100 % | 50-60 % | Sufficient (2) | 2 | 40 | 1,4 |
| | | 61-75 % | Good (3) | | | |
| | | 76-90 % | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | | | **17** | **43** | **2** |

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

| Evaluation elements | Description | Deadline | Compensation |
|---|---|---|---|
| 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 (15 hours of direct teaching) | - |
| Full exam (FE) | 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.<br>Students on exam (pre-printed questions) fit the questions asked in the form of rounding and written answers.<br>A written exam is a condition for access to an oral exam, when gets a final grade. | published test deadlines | - |

# Statistical methods and models

### Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Create, analyze and interpret the contingency table - ch2 test.<br>Calculate and test the statistical significance of correlation (Pearson correlation) with the help of computer support.<br>Identify and compare more than two Population means (ANOVA) with the help of computer support.<br>Perform and interpret univariate linear regression with the help of computer support.<br>Perform analysis and interpret the results of multivariate linear regression with the help of computer support. | Presentation of self-solving exercises | A2 |

### Grade evaluation=Passing the exam

| Evaluation elements | Maximum points or Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Lectures | - | | - | 15 | 15 | 1 |
| Self-solving exercises | 100% | Each of the four tasks that are correctly solved is evaluated with a mark from 2 to 5. | - | 0 | 29 | 1 |
| Presentation of exercises | | | | 1 | 0 | |
| **UKUPNO** | **100%** | | | **16** | **44** | **2** |

**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. Student may miss 2 hours. | semester (15 hours of direct lecturer) | - |
| Presentation of exercises | The student independently solved four excercises and presents them orally. The average mark of the all exercises is the mark f the course. All exercises must be positively evaluated. | during the semester or exam terms | |

# European forest types

### Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Present and interpret the forest vegetation of Europe through 14 categories of forest types. | Seminar, final exam. | A1, A3, B3, B9, D1, D2, D4, D5 |
| Classify forest vegetation of Croatia into European forest types. | Seminar, final exam. | A1, A3, B3, B9, B14, D1, D2, D4, D5 |
| Valorize the forest vegetation of Croatia in relation to the forest vegetation of Europe. | Seminar, final exam. | A1, A3, B9, D1, D2, D4, D5 |
| Implement forest ecosystem management and monitoring programs. | Seminar, final exam. | A1, A3, B3, B9, B14, D1, D5 |

### Grade evaluation=Passing the exam

| Evaluation elements | Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Lectures (L) | - | - | - | 15 | 0 | 0,5 |
| Designing seminar | 20% | Satisfies with major corrections or upgrades. | Sufficient (2) | 0 | 15 | 0,5 |
| | | Satisfies with significant | Good (3) | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| papers (SP) | | corrections and upgrades. | | | | |
| | | Satisfies with minor corrections and upgrades. | Very good (4) | | | |
| | | Satisfies completely. | Excellent (5) | | | |
| Final exam (FE) | 80% | 60-70% | Sufficient (2) | 0 | 30 | 1 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | **(FEx80 + SPx20)/100** | | **15** | **45** | **2** |

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

| Evaluation elements | Description | Deadline | Compensation |
|---|---|---|---|
| Attendance of lectures | The attendance is checked and the attendance of the students is recorded. A student may justifiably be absent with a maximum of 15% of direct teaching hours. | semester (15 hours of direct lecturer) | - |
| Written seminar paper (SP) | In the first half of the semester, the student is given the topic of seminar paper, which the student prepares during the semester, and at the end of the semester submits the lecturer to the exam. If assessed positively, it is accepted as an elaborated seminar paper. | in accordance with the agreed terms | - |
| Written exam (FE) | Examinations can be attended by students who have completed exercises and preparation and positive evaluation of the seminar paper. The students in the printed exam answer the questions asked. The written exam is evaluated and participates in the final grade of the subject. The final grade is obtained according to the formula (FEx80 + SPx20)/100 | exam terms | - |

# Small scale forest management planning

**Learning outcomes and evaluation methods**

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Define existing shortcomings in the current management of small scale private forests | Final Exam | A1, A2, B2, B3, B7, B11, B13, C4, C5, D2, D4, D5 |
| Analyze the existing regulations governing the management of small scale private forests | Final Exam | A1, A2, B2, B3, B7, B11, B13, C4, C5, D2, D4, D5 |
| Show and compare the specifics of small scale forest management | Final Exam | A1, A2, B2, B3, B7, B11, B13, C4, C5, D2, D4, D5 |
| Recognize and interpret the needs to adapt forest inventory methods for private forests | Final Exam | A1, A2, B2, B3, B7, B11, B13, C4, C5, D2, D4, D5 |
| Analyze and adopt skills of drafting regulations based on uneven age management models | Final Exam | A1, A2, B2, B3, B7, B11, B13, C4, C5, D2, D4, D5 |
| Plan the implementation of the forest owner's participation in creating the management plans for their forests | Final Exam | A1, A2, B2, B3, B7, B11, B13, C4, C5, D2, D4, D5 |
| Plan and compile guidelines for forest land consolidation within the management unit | Final Exam | A1, A2, B2, B3, B7, B11, B13, C4, C5, D2, D4, D5 |
| Evaluate and analyze the adopted management guidelines and estimate degree of the expected implementation | Final Exam | A1, A2, B2, B3, B7, B11, B13, C4, C5, D2, D4, D5 |

**Grade evaluation=Passing the exam**

| 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 | 1 |
| Final exam (ZI) | 100% | 60-70%<br>71-80%<br>81-90%<br>91-100% | sufficient (2)<br>good (3)<br>very good (4)<br>excellent (5) | 0 | 30 | 1 |
| **TOTAL** | 100% | | | **15** | **30** | **2** |

**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) | - |
| Exercises | The attendance of students is checked and recorded. A student may justifiably be absent with a maximum of 10 % 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 | - |

# Forest management planning

## Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| To analyse and to explain process planning and decisions (model structure of planning process, decision making model in forestry planning). | Computational and computer exercises, partial exams, knowledge tests, final. | B7 |
| To analyse and to present past management and development of forest resources (impact of natural and anthropogenic factors, usage of relevant data source, impact of management on age-class/diameter-class development, review of realized cut and management activities). | Computational and computer exercises, partial exams, knowledge tests, final. | B2 |
| To assess, to measure, to calculate and to present actual state of forest resources (social-economic-technological factors, elements of site and stand structure, stand border and area, derived structure elements, age-class and diameter-class forest structure, relation between actual and theoretical age-class/diameter class structure). | Computational and computer exercises, partial exams, knowledge tests, final. | B2, B7 |
| To explain, to project and to valuate elements of prognosis and planning of future forest resources management (types of prognosis and simulation methods of future development, defining of forest management objectives, tending and regeneration influence on forest development, projection of stand selection structure and influence of changes of age-class distribution). | Computational and computer exercises, partial exams, knowledge tests, final. | B2, B7, C4 |
| To calculate and to plan amount and structure of cut and other management activities (thinning cut on stand and forest level, regeneration cut on stand and forest level, selection cut on stand and forest level). | Computational and computer exercises, partial exams, knowledge tests, final. | B2, B7, C5 |

**Grade evaluation=Passing the exam**

| Evaluation elements | Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Lectures (L) | - | - | - | 30 | | 1 |
| Exercises (E) | 20% | Partially uncluttered, large correction and on time. | Sufficient (2) | 45 | 15 | 2 |
| | | 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) | - | - | - | 30 | | 1 |
| Partial exam 1 (PE1) | 40% | 60-70% | Sufficient (2) | 2 | 28 | 1 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| Partial exam 2 (PE2) | 40% | 60-70% | Sufficient (2) | 2 | 28 | 1 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | **(Ex20 + PE1x40-PE2x40)/100** | | **109** | **71** | **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 points |
|---|---|---|---|---|---|---|
| Final exam (FE) | 80 % | 60-70%<br>71-80%<br>81-90%<br>91-100% | Sufficient (2)<br>Good (3)<br>Very good (4)<br>Excellent (5) | 4 | 56 | 2 |
| **TOTAL** | **100%** | **(FEx80+Ex20)/100** | | | | |

**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 students attendance. Student is allowed exculpatory to absent of maximal 15% hours of direct teaching (10% of exercises and 20% of lectures). | semester (75 hours of direct teaching) | - |
| 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. Within computational and computer exercises (3 computational, 5 computer) two projects exercises are elaborate. 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. |

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| Written exam | Attendance to exam is allowed to student who regularly get 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 (5 questions are in essay form which can include graphs, and 5 question relate on solving of problem examples). Exam 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.<br>Written exam is evaluate and contribute in final grade of the course. | defined deadlines of partial exams during semester,<br><br>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 evaluate.<br>The finish grade is get according to equation:<br>(WIx40+OIx40+Ex20)/100 | | |