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

**Undergraduate study Wood technology**

# Evaluation methods and criteria

## Acad. year 2024/25.

**Learning outcomes of undergraduate study Wood Technology**

**A** General engineering competencies

A1 Apply a physical approach of experimental observation and mathematical modelling, solve mathematically various research and practical problems, statistically process, present and analyse data, and reach conclusions based on analysed data
A2 Apply basic laws of physics that present the basis of wood technology, understand Newton's axioms and apply them to solve technical problems, explain phenomena in the field of electrical engineering, and make accurate and optimal use of electric energy
A3 Competently maintain, work with and use the possibilities of basic technical components
A4 Apply skills in solving practical issues in the business, either by control measurements, calculations or testing verifications

**B** Focused engineering competencies

B1 Identify parts and shapes of trees, macroscopic, physical and chemical wood properties, identify and explain the anatomic structure of the xylem of wood-like plants, identify woodlike species based on different morphological characteristics, and apply theoretical and practical knowledge of commercially important indigenous and foreign species of wood and shrubbery
B2 Recognise and determine the most important types of xylophagous bacteria, insects, fungi and marine borers, and determine flaws on wood incurred due to their activity; learn the basic principles of wood protection based on physical, chemical and structural properties of wood, and apply basic procedures and methods for wood protection
B3 Apply knowledge about the mechanical properties of wood, mechanical properties arrangement within individual trees and group of trees, tree flaws and the influence of flaws on the mechanical properties of wood
B4 Apply technical knowledge for the purpose of mastering wood industry procedures and processes, means of work and material handling methods
B5 Organise transport of wood and wooden materials, calculate and adjust the capacities of means of transport with technological procedures, calculate and analyse energyconsumption, and recommend solutions for less complex wood and wooden material transport projects.

C Technological engineering competencies

C1 Analyse the wood cutting process, select, optimally use and maintain primary process machinery, select machinery working regimes and tools for final wood processing, and recommend project assignments to special equipment manufacturers
C2 Recognise and assess sawmilling raw material and products, conduct the categorisation and measurements of sawmilling raw material and products, apply basic skills of wood sawmilling technology and techniques of log and board sawing, and identify factors of successful sawmilling wood processes
C3 Monitor and control processes of massive wood, veneer and wood particle drying, other special drying processes, and wood steaming

C4 Recognise particular types of veneer and wood panel, analyse the basic structural components of wood panels, explain the interdependency of structural components and technical properties of wood panels, monitor and control the manufacturing process in wood board factories, select and use wood panels with optimal properties
C5 Size constructions, define systems of construction compositions, as a prerequisite for product construction, define the basic construction documentation and develop it systematically, apply CAD systems in wood industry and 2D modelling with the help of AutoCAD
C6 Use wood gluing technology, select materials with optimal properties important for final processing, apply simpler technological methods in final wood processing
C7 Define the specifics of wood usage in construction, recommend adequate applications of a particular type of wood for building purposes, recommend the basic shape, physical and construction solutions, explain and ensure functional requirements, types and construction solutions for main product groups
C8 Recommend materials and procedures that are applied in the wood finishing process in the interior and the exterior, operate the wood finishing process starting from base preparation to the hardening of the material

D Organisational engineering competencies

D1Plan and organise the time study, work rationalisation, and perform quality control in technological processes and on finished products, maintain supply, stock and logistic support optimization, plan and calculate the production, calculate basic business KPIs, write basic financial reports, recognise types of expenses
D2Perform wood industry specific calculations, define and analyse expenses, organise and conduct distribution, promotion and market research, plan products and product programmes, form product cost and selling prices, organise and conduct sales of wood and wooden products

E Development engineering competencies

E1 Continue specialization on university graduate studies at the Wood Technology Department of the Faculty of Forestry.

# The link between learning outcomes and the outcome of learning a study program

| Course code | General engineering competencies | | | | Focused engineering competencies | | | | | Technological engineering competencies | | | | | | | | Organisational engineering competencies | | Development engineering competencies |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A1 | A2 | A3 | A4 | B1 | B2 | B3 | B4 | B5 | C1 | C2 | C3 | C4 | C5 | C6 | C7 | C8 | D1 | D2 | E1 |
| 33556 | + | | + | | | | | | | | | | | | | | | | | + |
| 33557 | + | + | + | + | | | | | | | | | | | | | | | | |
| 228982 | | | | + | + | | | | | | | | | | | | | | | + |
| 228983 | | | | | + | | | | | | | | | | | | | | | |
| 228984 | | | | | | | | | | | | | | + | | | | | | + |
| 226038 | | | | | | | | | | | | | | | | | | | | + |
| 33627 | | + | | + | | | | | | | | | | | | | | | | |
| 33628 | | | | | + | | | | | | | | | | | | | | | |
| 228985 | | | | | | | | | | | | | | + | | | | | | + |
| 33630 | | | + | + | | | | | | | | | | | | | | | | |
| 33631 | + | + | | | | | + | + | + | | | | | | | | | | | |
| 228986 | | | | | + | | | | | | | | | | | | | | | |
| 226042 | | | | | | | | | | | | | | | | | | | | + |
| 33633 | | | | | | | | | | + | | | | | | | | | | |
| 239398 | + | | | | + | | + | | | | | | | | | | | | | |
| 33635 | | | | | | + | + | + | | | | | | | | + | | | | + |
| 236171 | | | | | | | | | | + | + | | | | | | | + | | |
| 33637 | + | | | + | | | | + | + | | | | | | | | | | | |
| 226043 | | | | | | | | | | | | | | | | | | | | + |
| 235953 | | | | | | | | | | | | | | + | | | | | | |
| 235955 | | | | | | | | | | | | + | | | | | | | | |
| 33644 | | | | | | | | | | | | | + | | | | | | | |
| 33642 | | | | | | | | | | | | | | | + | | | | | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 33643 | | | | | | | | | | | | | + | | | | | | |
| 33556 | + | | + | | | | | | | | | | | | | | | | + |
| 33557 | + | + | + | + | | | | | | | | | | | | | | | |
| 228982 | | | | + | + | | | | | | | | | | | | | | + |
| 235956 | | | | | | | | + | | | | | + | + | | | | | |
| 226045 | | | | | | | | | | | | | | | | | | | + |
| 33645 | | | | | | | | | | | | | | | | | + | | + |
| 33646 | | | | | | | | | | | | | | | + | | | | |
| 33636 | + | | | | | | | | | | | | | | | | | | |
| 33647 | | | | | | + | + | | | | | | | | + | + | + | | |
| 235956 | | | | | | | | + | | | | | + | + | | | | | |
| 226045 | | | | | | | | | | | | | | | | | | | + |
| 33645 | | | | | | | | | | | | | | | | | + | | + |
| 33646 | | | | | | | | | | | | | | | + | | | | |
| 33636 | + | | | | | | | | | | | | | | | | | | |
| 33647 | | | | | | + | + | | | | | | | | + | + | + | | |
| 33648 | | | | | | | | | | | | | | | | | | + | |
| 236194 | | | | | | | | + | | | | | + | + | | | + | | |
| 33649 | | | | | | | | | | | | | | | | | | + | + |
| 33650 | + | | | + | | | | + | | | | | | | | | + | | | + |
| 236196 | | | | + | | | | + | | + | + | + | + | | | | + | | + | |
| 236197 | | | | | | | | | | | | | | | | | | + | | |

# Mathematics

## Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Define and implement the tasks in terms of mathematical logic, sets, sets of numbers and mathematical induction | partial exams, oral exam | A1, A3, E1 |
| Define, analyse, and relate the concepts and properties of applied functions of a real variable, as well as terms related to sequences (limit of a sequence, limit of a function) | partial exams, oral exam | A1, A3, E1 |
| Define and apply the concepts of tasks derivatives, indefinite and definite integrals | partial exams, oral exam | A1, A3, E1 |
| Define, analyse and apply the tasks in terms of functions of two variables | partial exams, oral exam | A1, A3, E1 |
| Define the term and solve differential equations using a method of separation of variables | partial exams, oral exam | A1, A3, E1 |
| Define and apply the tasks from introductory elementary algebra (vectors and matrices) | partial exams, oral exam | A1, A3, E1 |

## Methods of grading

| Evaluation elements | Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Lectures (**P**) | 20% | | | 45 | | 1,4 |
| Exercises (**V**) | 20% | | | 45 | | 1,4 |
| 1st Partial exam (**$K_1$**) | 5% | (50 – 64)% | sufficient (2) | | 10 | 0,35 |
| 2nd Partial exam (**$K_2$**) | 25% | (65 – 77)% | good (3) | | 50 | 1,75 |
| 3rd Partial exam (**$K_3$**) | 20% | (78 – 89)% | very good (4) | | 40 | 1,4 |
| Oral exam (**UI**) | 10% | (90–100)% | excellent (5) | | 20 | 0,7 |
| **TOTAL** | **100%** | **$0,2P+0,2V+0,05K_1+0,25K_2+0,2K_3+0,1UI$** | | **90** | **120** | **7,0** |

| Evaluation elements | Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Lectures (**P**) | 20% | | | 45 | | 1,4 |
| Exercises (**V**) | 20% | | | 45 | | 1,4 |
| *1st Partial exam (**$K_1$**) | 5% | (50 – 64)% | sufficient (2) | | 10 | 0,35 |
| Written exam (**PI**) | 45% | (65 – 77)% | good (3) | | 90 | 3,15 |
| Oral exam (**UI**) | 10% | (78 – 89)% | | | 20 | 0,7 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | (90–100)% | very good (4)<br>excellent (5) | | | |
| **TOTAL** | **100%** | **0,2P+0,2V+0,05K$_1$+0,45PI+0,1UI** | | **90** | **120** | **7,0** |

*** students who do not pass all of three colloquium during the semester will approach the exam period (subject to the K$_1$)**

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

| Evaluation elements | Description | Deadline | Compensation |
|---|---|---|---|
| Lectures (**P**) | Attendance at lectures (minimum 80% of 45 hours=36h) | | |
| Exercises (**V**) | Attendance at exercises (minimum 80% of 45 hours=36h) | | |
| 1st Partial exam (**K$_1$**) | Minimum 50% for access to 2nd Partial exam or to exam period | | Multiple during semester |
| 2nd Partial exam (**K$_2$**) | Minimum 50% for access to 3rd Partial exam | | Multiple during semester |
| 3rd Partial exam (**K$_3$**) | Minimum 50% for access to Oral exam | | Multiple during the academic year |
| Written exam (**PI**) | Condition for access 0,8P+0,8V+0,5K$_1$ | exam period | |
| Oral exam (**UI**) | Condition for access 0,8P+0,8V+0,5K$_1$+0,5 K$_2$+0,5 K$_3$ or 0,8P+0,8V+0,5K$_1$+0,5PI | | |

# Physics

## Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Identify the vector and scalar quantities. | colloquium, final exam, oral exam | A1 |
| Explain the physical quantities that describe the translational motion | colloquium, final exam, oral exam | A1 |
| Different types of translational motion and performing kinematic expressions of translational motions. | colloquium, final exam, oral exam | A2 |
| Analyse the graphic description of the translational motion. | colloquium, final exam, oral exam | A2 |
| Explain and perform expressions describing a uniform circular motion. Describe the effects of centripetal and centrifugal forces. | colloquium, final exam, oral exam | A2 |
| Analyse the horizontal, vertical and piece shot | colloquium, final exam, oral exam | A2 |

| | | |
|---|---|---|
| Explain Newton's laws of motion. Explain Newton's general law of gravitation. | colloquium, final exam, oral exam | A2 |
| Distinguish the fundamental forces in nature. Sketch and analyse the action of more force on the body. Find out the expressions for the force impulse and the amount of motion. | colloquium, final exam, oral exam | A3 |
| Derive expressions for the impulse force and momentum. | colloquium, final exam, oral exam | A4 |
| Analyse the graphical description of the isothermal, arsenic and isobaric changes in the state of ideal gases. | colloquium, final exam, oral exam | A4 |
| Interpret the concept of work in the isobaric, isothermal and adiabatic change of state of an ideal gas | colloquium, final exam, oral exam | A2 |
| Explain and analyse Carnot's circular process. | colloquium, final exam, oral exam | A2 |
| Handle Mollier's h-x diagram. | colloquium, final exam, oral exam | A4 |

**Methods of grading**

| Evaluation elements | Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Partial exam 1 (PE 1)) | 30% | 50-64% | Sufficient (2) | 30 | 45 | 2,5 |
| | | 65-79% | Good (3) | | | |
| | | 80-89% | Very good (4) | | | |
| | | 90-100% | Excellent (5) | | | |
| Partial exam 2 (PE 2) | 30% | 50-64% | Sufficient (2) | 30 | 45 | 2,5 |
| | | 65-79% | Good (3) | | | |
| | | 80-89% | Very good (4) | | | |
| | | 90-100% | Excellent (5) | | | |
| **TOTAL** | **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) | 50 % | 50-64% | Sufficient (2) | 60 | 90 | 5 |

| | | | |
|---|---|---|---|
| | | 65-79% | Good (3) |
| | | 80-89% | Very good (4) |
| | | 90-100% | Excellent (5) |
| **TOTAL** | **100%** | | |

*** Students who do not pass through the semester during the semester will approach the exam time of 50% of the grade, and the remaining 50% make the grade from the oral part of the exam.**

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

| Evaluation elements | Description | Deadline | Compensation |
|---|---|---|---|
| Partial exam 1 | Students who regularly attend classes can access the first colloquium. The quiz consists of 5 assignments, each assignment being 20 points. Students have met the first partial exam if they achieve 50 points. | 8. week | Exceptionally, in the case of a justified reason for the absence. |
| Partial exam 2 | Students who attend classes regularly and who have collected at least 50 points in the first colloquium can approach another colloquium. The second colloquium consists of 5 assignments, each assignment being 20 points. The students met the second exam if they scored 50 points. | 15. week | Exceptionally, in the case of a justified reason for the absence. |
| Written exam | Exams can be accessed by students who regularly attend classes and did not meet the first or second qualifications. The written exam consists of 5 assignments, each carrying 20 points. The students met the written exam if they achieved 50 points, after which they approached the oral exam. The written exam is evaluated and participates in the final grade of the subject | examination deadlines | |
| 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 the arithmetic mean of the written and oral part of the exam. | - | Exceptionally, in the case of a justified reason for the absence. |

# Wood Chemistry

## Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Use the knowledge acquired in different wood technology areas and solve technological and qualitative tasks and problems in the wood industry. | Chemistry laboratory exercises, partial exams, test of knowledge, final exam | A4, B1, E1 |
| Explain the chemical composition and properties of wood and apply the same during the basic working and processing of wood | Chemistry laboratory exercises, partial exams, test of knowledge, final exam | A4, B1, E1 |

| | | |
|---|---|---|
| Analyse and isolate all chemical components, whether analytically or instrumentally, related to determining different properties or for further working and processing of wood | Chemistry laboratory exercises, partial exams, test of knowledge, final exam | A4, B1, E1 |

**Methods of grading**

| Evaluation elements | Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Lectures (**P**) | - | | | 45 | 10 | 0,5 |
| Exercises (**V**) | - | | | 45 | 30 | 1,5 |
| 1. partial exam (PE1) | 50% | 51-63% (102-126 points) | sufficient (2) | 5 | 45 | 2,5 |
| | | 64-76% (128-153 points) | good (3) | | | |
| | | 77-89% (154-179 points) | very good (4) | | | |
| | | 90-100% (180-200 points) | excellent (5) | | | |
| 2. partial exam (PE2) | 50% | 51-63% (102-126 points) | sufficient (2) | 5 | 45 | 2,5 |
| | | 64-76% (128-153 points) | good (3) | | | |
| | | 77-89% (154-179 points) | very good (4) | | | |
| | | 90-100% (180-200 points) | excellent (5) | | | |
| Total Final mark (FM) | **100%** | FM = PE1x50 + PE2x50)/100 | | 100 | 140 | 7 |

| 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% | 51-63% (102-126 points) | sufficient (2) | 5 | 90 | 1 |
| | | 64-76% (128-153 points) | good (3) | | | |
| | | 77-89% (154-179 points) | very good (4) | | | |
| | | 90-100% (180-200 points) | excellent (5) | | | |
| **TOTAL Final mark (FM)** | **100%** | **FM = FEx100/100** | | 5 | 90 | 1 |

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

| Evaluation elements | Description | Deadline | Compensation |
|---|---|---|---|
| Attendance of lectures and exercises | The attendance is checked, and the attendance of the students is recorded. The student can justifiably absent from the direct teaching as much as stipulated in the Rulebook on Studying. | Semester (90 hours of direct lecturer and exercises) | - |
| Exercises (E) | As a part of the exercise, 15 practical laboratory exercises in the chemical laboratory are conducted, which are related to the subject content and the knowledge upgrade adopted during the lectures. Students with task assignments and instructions for making all 15 exercises, as well as the appearance of the fascicles, liners and inserts, receive during the the first exercise in the form of Work Log. Exercise 1. The basics of laboratory chemistry work in the Work log is also a material for the qualification partial exam which is a prerequisite for the presence of other laboratory exercises in the chemical laboratory. The qualification partial exam consists of 8 questions and you need to answer exactly or more 5 answers for passage. | Continuously during the term of the semester according to the agreed term. Students who have created and explained all the exercises and those accepted by the teachers can access the exam. | - |
| Partial exam (PE) | Examination through the partial exams consists of two parts (1st and 2nd partial exam). Each partial exam consists of three units, namely (1) tasks, (2) structural formulas and (3) theories, and they must be taken in that order. The tasks consists of three questions (2 exact answers are required for the passage and does not enter the total sum of points) and the structural formula and theory of 10 questions where each question is worth for a maximum of 10 points (51% points required for the passage). The minimum number of points from both partial exams is 204 and a maximum of 400. The total score from the partial exams is also the final grade (no oral part of the exam). | Partial exam terms | |
| Written exam (WE) | Students who do not pass through the partial exams during the semester will approach the final exam that makes 100% of the grade. The final exam consists of three units, namely (1) tasks, (2) structural formulas and (3) theories and they must be taken in that order. The tasks consists of three questions (2 exact answers are required for the passage and does not enter the total sum of points) and the structural formula and theory of 10 questions where each question is worth for a maximum of 10 points (51% points required for the passage). The minimum number of points obtained is 102 and a maximum of 200. | Written exam terms | - |
| Oral exam (UI) | The oral exam is only in case the students want a higher final grade than the written exam. The requirement to enter an oral exam is that the score of the written exam is reached in the upper score of the score scale, is close to the score of the achieved score. | Exam terms | - |

# Wood Anatomy

## Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Explain the main terms of macroscopic, microscopic and submicroscopic characteristics of wood structure helpful in identifying and technical wood properties | Exercises in practicum, colloquium and exam | B1 |
| Differentiate native commercial wood species based on their microscopic and macroscopic characteristics with the help of wood identification keys. | Exercises in practicum, colloquium and exam | B1 |
| Explain variations in wood anatomy structure within the tree, between trees of each species and explain the influence of variations in wood structure on technical properties of wood and its use. | Exercises in practicum, colloquium and exam | B1 |
| Explain the origin of natural wood "defects", recognise them and explain their influence on selected technical properties. | Exercises in practicum, colloquium and exam | B1 |
| Explain the influence of wood anatomy structure on its technical properties | Exercises in practicum, colloquium and exam | B1 |

## Methods of grading

| Evaluation elements | Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Lectures | - | - | - | 45 | 25 | 2 |
| Exercises (E) | 5% | Mostly inaccurate, with major corrections | Sufficient (2) | 55 | 10 | 3 |
| | | Mostly accurate, with corrections | Good (3) | | | |
| | | Exact, with minor corrections | Very good (4) | | | |
| | | Accurate and error-free | Excellent (5) | | | |
| Microscopic Wood Identification Colloquium (C1) | 5% | Constant help of the examiner | Sufficient (2) | 2 | 10 | 1 |
| | | Partial help of the examiner | Good (3) | | | |
| | | Minor help of the examiner | Very good (4) | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | without any help of the examiner | Excellent (5) | | | |
| Macroscopic Wood Identification Colloquium (C2) | 15% | Constant help of the examiner | Sufficient (2) | 2 | 10 | 1 |
| | | Partial help of the examiner | Good (3) | | | |
| | | Minor help of the examiner | Very good (4) | | | |
| | | without any help of the examiner | Excellent (5) | | | |
| Exam ($E_x$) | 75% | 60-70% | Sufficient (2) | 1 | 25 | 1 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | **(Ex5+ C1x5 + C2X15+ $E_x$X75)/100** | | 110 | 80 | 8 |

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

| Evaluation elements | Description | Deadline | Compensation |
|---|---|---|---|
| Lectures | The attendance is checked and recorded. | Semester | - |
| Exercises (E) | Exercises are attended by groups. There are 7 practical exercises of microscopic and macroscopic recognition of wood. The accuracy, tidiness and regularity of performance are evaluated. | Semester (15 hours of exercises) | Exceptionally, in the case of a justified reason |
| Microscopic Wood Identification Colloquia (C1) | It consists of determination of 2 types of coniferous and wood with the aid of keys. The colloquium is evaluated and participates in the final evaluation of the subject. | 15. week | Colloquia can be taken three times in one academic year |
| Macroscopic Wood Identification Colloquia (C2) | It consists of determination of 10 types of coniferous and dicotyledonous woods with the aid of magnifiers. The colloquium is evaluated and participates in the final evaluation of the subject. | 15. week | Colloquia can be taken three times in one academic year |
| Exam ($E_x$) | The exam can be attended by students whose exercises and colloquia were evaluated positively. The written exam is evaluated and participates in the final grade of the subject. | Exam terms | - |
| Oral exam | Students get questions from different part of the subject program. Final mark of subject is achieved from the formula: **Ex5+C1x5+C2x15+Ex75/100** | | |

# Basics of design drawing

## Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Master the methods, techniques and materials of freelance design drawing | exercises, folder of papers, oral exam | C5, E1 |
| Master the perception, proportion, composition and observation and analysis of products and spaces and their transfer to paper | exercises, folder of papers, oral exam | C5, E1 |
| Analyse and draw the observed object in proportion using different drawing techniques, in spatial dawn (perspective) and orthogonal projection | exercises, folder of papers, oral exam | C5, E1 |
| Draw an object according to visual memory with the application of the principle of aesthetic order | exercises, folder of papers, oral exam | C5, E1 |
| Master critical thinking and visual expression on given examples | exercises, folder of papers, oral exam | C5, E1 |

## Methods of grading

| Evaluation elements | Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Lectures (L) | 0 | | | 30 | 0 | 0,5 |
| Exercises (E) | 90% | Partial understanding of the adopted subject, poor student activity and the quality of the project task solution. | Sufficient (2) | 30 | 25 | 1 |
| | | Partial understanding of the adopted subject, good student activity and quality of the project task solution. | Good (3) | | | |
| | | Very well applied and adopted material, very good student activity and quality of the project task solution. | Very good (4) | | | |
| | | Exceptional engagement, excellent applied and adopted material, excellent student activity and the quality of the project task solution. | Excellent (5) | | | |
| Oral exam (OE) | 10% | 60-70% | Sufficient (2) | 0 | 5 | 0,5 |
| | | 71-80% | Good (3) | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | **(E×90 + OE×10) / 100** | | 60 | 30 | 2 |

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

| Evaluation elements | Description | Deadline | Compensation |
|---|---|---|---|
| Lectures | The attendance is checked and the presence of students is recorded. The student can justifiably be absent with a maximum of 20% of the tuition. | according to syllabus | |
| Exercises | The exercises are checked and recorded by the presence of students. The student can justifiably absent with a maximum of 10% of the exercise. During the semester, the student prepares exercises / tasks in team and individual work, monitoring continuous student progress and adopting thematic knowledge and skills, in accordance with the evaluation criteria. The right to sign is obtained by the number of attendance classes and exercises as well as assignments and seminars within the given deadline. It is obligatory to submit each phase of the project task to insight. Submission of the project task is by deadline, by the end of the semester. | according the syllabus | |
| Oral exam | Requirements for the oral part of the exams are devoted and positively evaluated exercises, is project assignment, all other assignments and seminar papers. The oral exam consists of verbal defence (presentation) of the project task solution and the understanding of all phases of designing the conceptual and execution solution in the project assignment as well as the understanding and adoption of knowledge in lectures and exercises. The final grade is obtained according to the formula: (V × 90 + + UI × 10) / 100 | exam terms | |

# Physical and health education 1

## Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Describe the structure of the physical exercise class. | exercises, correction and evaluation exercises | E1 |
| Explanation of the impact of physical exercise on health. | exercises, correction and evaluation exercises | E1 |
| Choose fitness exercises designed to strengthen individual muscle groups. | exercises, correction and demonstration | E1 |
| Demonstrate specific exercises with regard to kinesiologic activity. | exercises, structural analysis, assistance, correction and evaluation exercises | E1 |

| | | |
|---|---|---|
| Organize constructive free time | Exercises and evaluation exercises | E1 |
| Assess personal diet and physical exercise habits. | exercise, diet diary correction and evaluation exercises | E1 |
| Demonstrate general preparatory exercises and stretching exercises. | exercises, description, demonstration, correction | E1 |
| Understanding kinesiology programs and their target orientation. | exercises, description, demonstration, correction | E1 |
| Control emotions and strengthen self-control. | Exercises, correction | E1 |

## Engineering mechanics

### Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Determine the resultant force of the system of forces acting on a body | partial exams, written exam, oral exam | A2 |
| Calculate the moment of the force around an axis | partial exams, written exam, oral exam | A2 |
| Model the contact forces at the body contact points with the other body and environment | partial exams, written exam, oral exam | A2 |
| Write conditions/equations for the equilibrium of forces acting on a body | partial exams, written exam, oral exam | A2 |
| Calculate reactive forces to keep the body in equilibrium | partial exams, written exam, oral exam | A2 |
| Calculate the force of friction | partial exams, written exam, oral exam | A2 |
| Determine the forces of belt friction | partial exams, written exam, oral exam | A2 |
| Determine axial forces and draw axial forces diagram for axially loaded rods | partial exams, written exam, oral exam | A2 |
| Determine sheer forces and bending moments and draw diagrams of shear forces and bending moments on a beam | partial exams, written exam, oral exam | A2 |
| Calculate twisting moments of torsional - loaded shaft and draw diagrams of twisting moments | partial exams, written exam, oral exam | A2 |
| Determine stress and deformation of axially loaded rod | partial exams, written exam, oral exam | A2 |

| | | |
|---|---|---|
| Determine shear stress | partial exams, written exam, oral exam | A2 |
| Calculate stress and deformation of a shaft subjected to torsion | partial exams, written exam, oral exam | A2 |
| Determine bending stress | partial exams, written exam, oral exam | A2 |
| Determine dimensions of cross sections of structural members based on material strength criteria | partial exams, written exam, oral exam | A4 |
| Examine the stability of columns | partial exams, written exam, oral exam | A2 |

## Methods of grading

| Evaluation elements | Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average student's workload hours outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Lectures (L) | - | - | - | 30 | - | 0 |
| Exercises (E) | - | - | - | 30 | - | 0 |
| Partial exam 1 (PE1) | 17 % | 50 – 67 %<br>68 – 78 %<br>79 – 89 %<br>90 - 100 % | Sufficient (2)<br>Good (3)<br>Very good (4)<br>Excellent (5) | | 15 | 1,0 |
| Partial exam 2 (PE2) | 17 % | 50 – 67 %<br>68 – 78 %<br>79 – 89 %<br>90 - 100 % | Sufficient (2)<br>Good (3)<br>Very good (4)<br>Excellent (5) | | 15 | 1,0 |
| Partial exam 3 (PE3) | 17 % | 50 – 67 %<br>68 – 78 %<br>79 – 89 %<br>90 - 100 % | Sufficient (2)<br>Good (3)<br>Very good (4)<br>Excellent (5) | | 15 | 1,0 |
| Oral exam (OE) | 49 % | 50 – 67 %<br>68 – 78 %<br>79 – 89 %<br>90 - 100 % | Sufficient (2)<br>Good (3)<br>Very good (4)<br>Excellent (5) | | 45 | 2 |
| **TOTAL** | **100%** | **((PE1+PE2+PE3)x17+OEx49)/100** | | 60 | 90 | 5 |

| Evaluation elements | Maximum points or share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average student's workload hours outside the direct teaching | ECTS points |
|---|---|---|---|---|---|---|

| | | | | | | |
|---|---|---|---|---|---|---|
| Written exam* (WE) | 50 % | 50 – 67 %<br>68 – 78 %<br>79 – 89 %<br>90 - 100 % | Sufficient (2)<br>Good (3)<br>Very good (4)<br>Excellent (5) | | 45 | 2,5 |
| Oral exam* (OE) | 50 % | 50 – 67 %<br>68 – 78 %<br>79 – 89 %<br>90 - 100 % | Sufficient (2)<br>Good (3)<br>Very good (4)<br>Excellent (5) | | 45 | 2,5 |
| **TOTAL** | **100%** | **(WEx50+OEx50)/100** | | | | **5** |
| *** Students who do not pass tests during the semester will approach the exam, during examination period, that makes 100% of the grade (written exam - 50%, oral exam - 50%)** | | | | | | |

**Detailed description of evaluation elements for lectures, exercises, partial exams, written and oral 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 miss maximum 20% of hours of direct teaching. | semester (60 hours of direct teaching) | - |
| Partial exams (PE1, PE2, PE3) | Students who regularly attend classes can take semester tests, making it easier pass the exam "stage by stage". The semester tests are evaluated and participate in the final grade. | K1 – 6. week<br>K2 – 11. week<br>K3 – after the lectures | - |
| Written exam | Exams can be taken by students who have sufficient attendance at lectures. Students solve tasks containing computational problems. The written exam is evaluated and participates in the final grade of the subject. | Examination period | - |
| Oral exam | Students who pass 3 semester tests or a written exam are asked questions from different parts of the curriculum content. The final grade of the course is obtained according to the formula<br>**((PE1+PE2+PE3)x17+OEx49)/100 or (WEx50+OEx50)/100** | | |

# The Basics of Dendrology

## Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| To define and explain biological features and morphological characteristics of the selected genera of autochthonous and allochthonous gymnosperms and angiosperms; | final exam | B1 |

| | | |
|---|---|---|
| To identify and describe economically important autochthonous and allochthonous gymnosperm and angiosperm tree species according to: bark, twigs and buds in winter, leaves, cones, fruits and seeds; | final exam | B1 |
| To use determination keys; | final exam | B1 |
| To group autochthonous and allochthonous gymnosperm and angiosperm tree species according to biological features, morphological characteristics, distribution and economic importance; | final exam | B1 |

**Methods of grading**

| Evaluation elements | Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Lectures (L) | | | | 15 | | 0.5 |
| Exercises (E) | 5% | 60-70% | Sufficient (2) | 30 | | 1 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| Homework (HW) | 5% | 70-80% | Sufficient (2) | | 15 | 0.5 |
| | | 81-89% | Good (3) | | | |
| | | 90-94% | Very good (4) | | | |
| | | 95-100% | Excellent (5) | | | |
| Herbarium collection (H) | | | | | 15 | 0.5 |
| **TOTAL** | **10%** | **(Ex5+HWx5)/1 00** | | 45 | 30 | 2,5 |

| 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) | 90 % | 60-70% | Sufficient (2) | 15 | 0.5 |
| | | 71-80% | Good (3) | | |
| | | 81-90% | Very good (4) | | |
| | | 91-100% | Excellent (5) | | |
| **TOTAL** | **100%** | **(FEx90+Ex5+HWx5)/100** | | | |

*** students take the final exam that is 90% of the grade; the remaining 5% is the grade of the exercises and 5% the grade of the homework**

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

| Evaluation elements | Description | Deadline | Compensation |
|---|---|---|---|
| Attendance of lectures and exercises | Student attendance is recorded. Student may not be absent more than 20% of lectures and 10% of exercises. | II semester | |
| Exercises | The exercises are attended in groups. The students use plant material and determination keys. The practicum exercises enable students to acquire practical skills to recognize woody species on the basis of different morphological characteristics: leaves, twigs of deciduous species in winter, cones, fruits and seeds. At the end of each exercise the accuracy of determination is evaluated, and the evaluation affects the final grade. | II semester | |
| Homework | After each lecture and practicum exercises, the students do their homework and submit it via the Herbarium DEND application. The homework is evaluated and affects the final grade. | II semester | |
| Herbarium collection | On field exercises students collect herbarium specimens. Professor's signature confirms the accuracy of the herbarium. | II semester | |
| Written exam | Access requirements: professor's signature (regular attendance at lectures and exercises; positively graded all exercises and homework; collected and signed herbarium). | Exam terms | |
| Oral exam | Access requirement: positively graded written exam. In the oral part, apart from theoretical knowledge, students have a practical determination of trees according to different morphological characteristics. The final grade is obtained according to the formula: (FEx90+ Ex5+HWx5)/100 | Exam terms | |

# Applied technical graphics

## Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Apply technical standards for drawing orthogonal projection, characteristic sections and isometry of wooden models; | Correction and evaluation of exercises, final exam | C5, E1 |
| Create technical documentation using traditional and CAD 2D techniques in accordance with technical standards used in the wood industry | Correction and evaluation of exercises, final exam | C5, E1 |

| | | |
|---|---|---|
| Apply the basics of CAD 3D computer technology for designing 3D models and creating technical documentation | Exercises in a computer classroom, correction and evaluation of exercises, final exam | C5, E1 |

## Methods of grading

| Evaluation elements | Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Lectures (L) | 10% | Transcribed lectures with less than 15% of the eligible weaknesses of the application of technical standards | Sufficient (2) | 15 | 15 | 1 |
| | | Transcribed lectures with less than 10% of the eligible weaknesses of the application of technical standards | Good (3) | | | |
| | | Transcribed lectures with less than 5% of the eligible weaknesses of the application of technical standards | Very good (4) | | | |
| | | Transcribed lectures without any weaknesses of the application of technical standards | Excellent (5) | | | |
| Exercises (E) | 30% | The exact exercise with less than 15% of the eligible weaknesses of the application of technical standards | Sufficient (2) | 45 | 30 | 2,5 |
| | | The exact exercise with less than 10% of the eligible weaknesses of the application of technical standards | Good (3) | | | |
| | | The exact exercise with less than 5% of the eligible weaknesses of the application of technical standards | Very good (4) | | | |
| | | The exact exercise without any weaknesses of the application of technical standards | Excellent (5) | | | |
| Partial exam – orthogonal projection (Colloquia) (PE) | 30% | 60-70% | Sufficient (2) | 2 | 19 | 0,7 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| Partial exam – cross section (Colloquia) (PE) | 30% | 60-70% | Sufficient (2) | 2 | 22 | 0,8 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | 91-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | **(Lx10+Ex30 + 2PEx30)/100** | | 64 | 86 | 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) | 80 % | 60-70% | Sufficient (2) | 4 | 41 | 1,5 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | **(FE80+E20)/100** | | | | |

*students who do not pass through the colloquia approach the exam that makes 80% of the grade, and the remaining 20% make a grade out of the exercise

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

| **Evaluation elements** | **Description** | **Deadline** | **Compensation** |
|---|---|---|---|
| Attendance of lectures and exercises | The presence of students on the class is recorded. A student may justifiably be absent with a maximum of 15% of direct teaching hours. The student activity is recorded. | semester (60 hours of direct lecturer) | - |
| Making exercises | The exercises are performed in groups. Each exercise can be evaluated two times. If the rate is insufficient (1) or it is not evaluated, exercise can be given on conditional terms (if student have less absented hours than is prescribed if average grade of all exercises is more than sufficient (2). | In order to Syllabus | Two conditional terms for exercise evaluation |
| Partial exam / First colloquium (K1) | On the first colloquium can attend students how have positive grade of 1. exercise and have no absent more than 15%. It is needed to collect 60% for positive grade. | 11. week | - |
| Partial exam / Second colloquium (K2) | On the second colloquium can attend students how have more than 60 % points from the first colloquium. Students who collect 60% from both colloquiums obtain the final grade. The final grade is the average score from the exercise and the score by the points. An oral check of computer drawing skills follows behind the colloquium. | 15. week | - |
| Written exam | Written exam has four drawing tasks. Drawings are made in sketch. | Exam terms | - |
| Oral exam | Passed written exam is needed for taking oral exam. Verification of theoretical knowledge (from scripts), understanding of projections and drawing in AutoCAD and 3D modelling in Inventor. The final grade is obtained according to the formula **(FE80+E20)/100** | | - |

# Wood industry mechanical engineering

## Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Define mechanical properties and testing | partial exam, written exam, oral exam | A3, A4 |
| Compare effects of heat and chemical-heat treatment of steel on a dynamic load of machine elements | partial exam, written exam, oral exam | A3, A4 |
| Analyse the use of tool steels and new materials in production phases of mechanical processing | partial exam, written exam, oral exam | A3, A4 |
| Identification of connecting elements, power and motion transmission elements | partial exam, written exam, oral exam | A3, A4 |
| Calculate load magnitude at non-separable and separable joints | partial exam, written exam, oral exam | A3, A4 |
| Check main quantities in work with rotation motion elements, peripheral and angular velocity, speed frequency, torque | partial exam, written exam, oral exam | A3, A4 |
| Calculate power transfer elements by friction and engagement | partial exam, written exam, oral exam | A3, A4 |
| Construct machine elements and define their application | partial exam, written exam, oral exam | A3, A4 |
| Apply basic technical criteria for designing and dimensioning machine elements (factor of safety) | partial exam, written exam, oral exam | A3, A4 |
| Analysis of piping, stop, safety and regulating organs from the point of pressure loss | partial exam, written exam, oral exam | A3, A4 |
| Compare fusion and force (friction) welding methods in WI plants and calculation of stress in welded joints | partial exam, written exam, oral exam | A3, A4 |
| Check and compare working features of turbopumps on Q - H, Q – η, Q – P diagrams | partial exam, written exam, oral exam | A3, A4 |
| Differ types and characteristics of turbine plants in WI plants | partial exam, written exam, oral exam | A3, A4 |
| Analyse the operation of the internal combustion engine from the standpoint of energy consumption considering the travelled distance | partial exam, written exam, oral exam | A3, A4 |

| | | |
|---|---|---|
| Describe existing energy problems in WI and make plans for the application of renewable energy sources (forest biomass) | partial exam, written exam, oral exam | A3, A4 |

**Methods of grading**

| Evaluation elements | Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Lectures (L) | - | - | - | 30 | 0 | |
| Exercises (E) | - | - | - | 30 | 0 | |
| Partial exam 1 (PE1) | 16 % | 50 - 67 %<br>68 - 78 %<br>79 - 89 %<br>90 - 100 % | Sufficient (2)<br>Good (3)<br>Very good(4)<br>Excellent (5) | | 15 | 0,8 |
| Partial exam 2 (PE2) | 17 % | 50 - 67 %<br>68 - 78 %<br>79 - 89 %<br>90 - 100 % | Sufficient (2)<br>Good (3)<br>Very good(4)<br>Excellent (5) | | 20 | 0,85 |
| Partial exam 3 (PE3) | 17 % | 50 - 67 %<br>68 - 78 %<br>79 - 89 %<br>90 - 100 % | Sufficient (2)<br>Good (3)<br>Very good(4)<br>Excellent (5) | | 20 | 0,85 |
| Oral exam (OE) | 50 % | 50 - 67 %<br>68 - 78 %<br>79 - 89 %<br>90 - 100 % | Sufficient (2)<br>Good (3)<br>Very good(4)<br>Excellent (5) | | 25 | 2,5 |
| **TOTAL** | **100 %** | **(((PE1x16)+(PE2+PE3)x17 + OEx50)/100** | | 60 | 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 |
|---|---|---|---|---|---|---|
| Written exam*(WE) | 50% | 50 - 67 %<br>68 - 78 %<br>79 - 89 %<br>90 - 100 % | Sufficient (2)<br>Good (3)<br>Very good(4)<br>Excellent (5) | | 50 | 2,5 |
| Oral exam* (OE) | 50% | 50 - 67 %<br>68 - 78 % | Sufficient (2)<br>Good (3) | | 30 | 2,5 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | 79 - 89 %<br>90 - 100 % | Very good(4)<br>Excellent (5) | | | |
| **TOTAL** | **100 %** | **(WEx50+OEx50)/100** | | | | |

*** students who do not pass the exam through the partial exams during the semester, will approach the final exam which makes 100% of the grade (written exam - 50%, oral exam 50%).**

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

| Evaluation elements | Description | Deadline | Compensation |
|---|---|---|---|
| Lectures + exercises | The teaching attendance is checked and recorded. Students may be absent with a maximum share of 20 % of direct teaching. | semester (60 hours of direct lecturer) | - |
| Partial exam (PE1, PE2, PE3) | Students who regularly attend teachings can approach the writing of a partial exam, making them easier to pass the exam because the lessons are learned in the "stages". The partial exam is evaluated and participates in the final grade. | PE1 – 6. week PE2 – 11. week PE3 – after finished lectures | - |
| Written exam | Exams can be attended by students who have sufficient teaching attendance. Students solve tasks and answer asked questions. The written exam is evaluated and participates in the final grade. | Exam terms | - |
| Oral exam | Students who pass 3 partial exams or a written exam are asked for questions from different parts of the teaching program content. The final grade is obtained according to the formula<br><br>**(((PE1x16)+(PE2+PE3)x17 + OEx50)/100 or WEx50+OEx50/100** | | |

# Fundamentals of electrotechnics

## Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Define Coulomb's law and explain the meaning of the constants in the expression for the Coulomb force. | colloquium, final exam, oral exam | A2 |
| Name and describe the physical quantity which describes the electric field. | colloquium, final exam, oral exam | A1 |
| Apply the Gaussian law, for example, to determine the electric field of charged metal spheres, plates and capacitors. | colloquium, final exam, oral exam | B4 |
| Analyse the serial and parallel condenser connections. | colloquium, final exam, oral exam | B3 |
| Explain the capacity of the capacitor and the role of the dielectric at the capacitor. | colloquium, final exam, oral exam | B3 |

| | | |
|---|---|---|
| Describe direct current sources. Demonstrate Kirchhoff's rules on an arbitrary example. | colloquium, final exam, oral exam | A3 |
| Analyse complex current circuits of direct current. Explain the occurrence of magnetism and electromagnetic induction. | colloquium, final exam, oral exam | B5 |
| Use the rule of the right hand to determine the direction of Amper and Lorentz force. | colloquium, final exam, oral exam | B5 |
| Appoint and describe the physical size of the alternating current with appropriate current and effective values. | colloquium, final exam, oral exam | A2 |
| Analyse the RLC titre circle and explain the role of each element in the circle | colloquium, final exam, oral exam | B5 |
| Distinguish the active, reactive and apparent power of alternating current. | colloquium, final exam, oral exam | A2 |
| Explain the principle of electric motor and generator operation. Analyse the three-phase system. Interpret electrical measurements in woodworking plants. | colloquium, final exam, oral exam | B3 |

## Methods of grading

| Evaluation elements | Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Partial exam 1 (PE 1)) | 30% | 50-64% | Sufficient (2) | 30 | 30 | 2,5 |
| | | 65-79% | Good (3) | | | |
| | | 80-89% | Very good (4) | | | |
| | | 90-100% | Excellent (5) | | | |
| Partial exam 2 (PE 2) | 30% | 50-64% | Sufficient (2) | 30 | 30 | 2,5 |
| | | 65-79% | Good (3) | | | |
| | | 80-89% | Very good (4) | | | |
| | | 90-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | | | 60 | 60 | 4 |

| Evaluation elements | Maximum points or share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Final exam (FE) | 50 % | 50-64% | Sufficient (2) | 60 | 60 | 4 |
| | | 65-79% | Good (3) | | | |
| | | 80-89% | Very good (4) | | | |
| | | 90-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | | | | | |

*** Students who do not pass through the semester during the semester will approach the exam time of 50% of the grade, and the remaining 50% make the grade from the oral part of the exam**

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

| Evaluation elements | Description | Deadline | Compensation |
|---|---|---|---|
| Partial exam 1 | Students who regularly attend classes can access the first colloquium. The quiz consists of 5 assignments, each assignment being 20 points. Students have met the first partial exam if they achieve 50 points. | 8. week | Exceptionally, in the case of a justified reason for the absence. |
| Partial exam 2 | Students who attend classes regularly and who have collected at least 50 points in the first colloquium can approach another colloquium. The second colloquium consists of 5 assignments, each assignment being 20 points. The students met the second exam if they scored 50 points. | 15. week | Exceptionally, in the case of a justified reason for the absence. |
| Written exam | Exams can be accessed by students who regularly attend classes and did not meet the first or second qualifications. The written exam consists of 5 assignments, each carrying 20 points. The students met the written exam if they achieved 50 points, after which they approached the oral exam. The written exam is evaluated and participates in the final grade of the subject | examination deadlines | |
| 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 the arithmetic mean of the written and oral part of the exam. | - | Exceptionally, in the case of a justified reason for the absence. |

# Technical properties of wood I

## Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Determine parameters essential for the identification of commercial wood species, tree parts and tree modifications | Exercises evaluation, partial exams, final exam | B1 |

| | | |
|---|---|---|
| Defining the structure of wood as a factor in the properties of wood | Exercises evaluation, partial exams, final exam | B1 |
| Wood cross-sectional properties | Exercises evaluation, partial exams, final exam | B1 |
| Defining and determining the physical properties of wood | Exercises evaluation, partial exams, final exam | B1 |
| Defining and determining the most significant factors that affect the physical properties of wood | Exercises evaluation, partial exams, final exam | B1 |
| Defining the distribution of physical properties of wood in the radial direction | Exercises evaluation, partial exams, final exam | B1 |

**Methods of grading**

| Evaluation elements | Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students' workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Lectures (L) | - | - | - | 45 | 75 | 3 |
| Exercises (E) | 70% | Partly orderly and understandable, with major improvements required and on time | Sufficient (2) | 60 | 30 | 3 |
| | | Orderly, readable, with major improvements required and on time | Good (3) | | | |
| | | Orderly, readable, with minor improvements required and on time | Very good (4) | | | |
| | | Orderly, readable, accurate and on time | Excellent (5) | | | |
| Partial exam 1 (PE1) | 30% | 61-70% | Sufficient (2) | 1 | 29 | 1 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | **(Ex70+ PE1x30)/100** | | 106 | 135 | 7 |

| Evaluation elements | Maximum points or share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students' workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|

| | | | | | | |
|---|---|---|---|---|---|---|
| Final exam (FE) | 100 % | 61-70%<br>71-80%<br>81-90%<br>91-100% | Sufficient (2)<br>Good (3)<br>Very good (4)<br>Excellent (5) | 2 | 28 | 1 |
| **TOTAL** | **100%** | **(Fex100)/100** | | | | |
| | *** students who don't pass the partial exams during the semester have to attend the final exam which is 100% of the grade.** | | | | | |

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

| Evaluation elements | Description | Deadline | Compensation |
|---|---|---|---|
| Attendance of lectures and exercise | Students attendance is checked and notified. Student can miss 15% of the classes justifiably the most. | semester (105 hours of direct lectures) | - |
| Exercise project | Exercises are given in groups and student make exercise project individually. Each project is complex (1 project) and it is made in parts corresponding to teaching parts. Student presents the whole project at the end of semester, and each part is evaluated on lectures during the semester. | end of semester | |
| Partial exam 1 | First partial exam can be attended by students who did not miss more than 15% of lectures and exercises. | end of semester | |
| Written and oral exam | Students who did not pass the subject through partial exams and exercise project (less the 61% of points), or who are not satisfied with the grade, can attend the final oral exam in given exam periods. The grade given on oral exam is final and it makes 100% of the grade. | In given exam periods | |

# Physical and health education 2

## Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Describe the structure of the physical exercise class. | exercises, correction and evaluation exercises | E1 |
| Explanation of the impact of physical exercise on health. | exercises, correction and evaluation exercises | E1 |
| Choose fitness exercises designed to strengthen individual muscle groups. | exercises, correction and demonstration | E1 |
| Demonstrate specific exercises with regard to kinesiologic activity. | exercises, structural analysis, assistance, correction and evaluation exercises | E1 |
| Organize constructive free time | Exercises and evaluation exercises | E1 |

| | | |
|---|---|---|
| Assess personal diet and physical exercise habits. | exercise, diet diary correction and evaluation exercises | E1 |
| Demonstrate general preparatory exercises and stretching exercises. | exercises, description, demonstration, correction | E1 |
| Understanding kinesiology programs and their target orientation. | exercises, description, demonstration, correction | E1 |
| Control emotions and strengthen self-control. | Exercises, correction | E1 |

## Woodworking machinery I

### Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Distinguish characteristic types of woodworking machines and tools with and without forming wood shavings (saw blades, circular saw blades, planers, mills, drills, lathes) | partial exam, final exam | C1 |
| Explain the term elementary blade and sketch the basic geometrical cutting edge elements. | partial exam, final exam | C1 |
| Explain the difference between elemental and real blade. | partial exam, final exam | C1 |
| Identify the basic forms of tool-tip blunting and distinguish the causes of wear that cause some form of blunting. | partial exam, final exam | C1 |
| Differentiate the basic materials for making tool blades (tool steel, high-speed steel, hard alloy, hard metals, artificial diamonds) and basic properties of these materials that are essential for woodworking (strength, hardness, temperature stability). | partial exam, final exam | C1 |
| Group influential variables on tool-tip life time in different processing conditions and analyse their mutual relationship. | partial exam, final exam | C1 |
| Sketch and analyse forces on the tool-tip. | partial exam, final exam | C1 |
| Explain the role of individual cutting edge elements during cutting. | partial exam, final exam | C1 |
| Identify wood properties and tool-tip characteristics that affect the cutting process. | partial exam, final exam | C1 |

| | | |
|---|---|---|
| Identify the basic types of wood shavings in mechanical woodworking and identify the causes of the formation of a particular type of shaving. | partial exam, final exam | C1 |
| List the influential parameters and calculate the specific cutting resistance in the given processing conditions. | partial exam, final exam | C1 |
| Calculate the technological parameters for basic types of woodworking machines | partial exam, final exam | C1 |
| Calculate the cutting forces in basic types of woodworking machines | partial exam, final exam | C1 |
| Calculate the cutting power and electric motor power required for basic types of woodworking machines | partial exam, final exam | C1 |
| Calculate the capacity of basic types of woodworking machines | partial exam, final exam | C1 |
| Sketch the basic woodworking tools (saw blades, circular saw blades, milling cutter, drill bit) with all the essential elements (tool diameter, tool blade angles, etc.). | partial exam, final exam | C1 |

**Methods of grading**

| Evaluation elements | Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students' workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Lectures (L) | - | - | - | 45 | 0 | 1,5 |
| Exercises (E) | - | - | - | 45 | 0 | 1,5 |
| Partial exam 1 (PE1) | 50% | 50-60% | Sufficient (2) | 2 | 43 | 1,5 |
| | | 61-75% | Good (3) | | | |
| | | 76-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| Partial exam 2 (PE2) | 50% | 50-60% | Sufficient (2) | 2 | 43 | 1,5 |
| | | 61-75% | Good (3) | | | |
| | | 76-90% | Very good (4) | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | 91-100% | Excellent (5) | | | |
| **UKUPNO** | **100%** | **(P + V + K1x50 + K2x50)/100** | | **94** | **86** | **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 bodovi** |
|---|---|---|---|---|---|---|
| Final exam (FE) | 100 % | 50-60% | Sufficient (2) | 4 | 86 | 3 |
| | | 61-75% | Good (3) | | | |
| | | 76-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | **(FEx1)/100** | | | | |

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

| **Evaluation elements** | **Description** | **Deadline** | **Compensation** |
|---|---|---|---|
| Attendance of lectures and exercises | The attendance is checked and the attendance of the students is recorded. A student may justifiably be absent with a maximum of 15% of direct teaching hours. | semester (90 hours of direct lecturer) | - |
| Partial exam 1 (PE1) | The partial exam can be accessed by all students. | 9. week | |
| Partial exam 2 (PE2) | The second partial exam can be accessed by students who have passed the first partial exam.<br>Students who get enough points from both partial exams get a final score. | 15. week | |
| Written exam | The written exam consists of three numerical tasks in the field of band saws, circular saw, planer, milling machine, drill and lathe. For the passage it is necessary to have at least 50% of the total number of 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. Theoretical knowledge. understanding and detailed examination of the subjects studied in the lectures, is checked.<br>The final grade is obtained according to the formula **(FEx100)/100** | Exam terms | |

# Technical properties of wood II

## Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Introduction to measuring instruments for determining the mechanical properties of wood | Exercises evaluation, partial exams, final exam | A1, B1, B3 |
| Determination of mechanical properties of wood | Exercises evaluation, partial exams, final exam | A1, B1, B3 |
| Evaluation of wood species based on mechanical properties of wood | Exercises evaluation, partial exams, final exam | A1, B1, B3 |
| Defining the radial distribution of mechanical properties of wood and their impact on further processing and use of wood | Exercises evaluation, partial exams, final exam | A1, B1, B3 |
| Defining wood defects on trees and round wood | Exercises evaluation, partial exams, final exam | A1, B1, B3 |
| Practical recognition and valorisation of wood defects on trees and round wood | Exercises evaluation, partial exams, final exam | A1, B1, B3 |

## Methods of grading

| Evaluation elements | Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students' workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Lectures (L) | - | - | - | 30 | 15 | 2 |
| Exercises (E) | 70% | Partly orderly and understandable, with major improvements required and on time | Sufficient (2) | 30 | 30 | 1 |
| | | Orderly, readable, with major improvements required and on time | Good (3) | | | |
| | | Orderly, readable, with minor improvements required and on time | Very good (4) | | | |
| | | Orderly, readable, accurate and on time | Excellent (5) | | | |
| Partial exam 1 (PE1) | 30% | 61-70% | Sufficient (2) | 1 | 14 | 2 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | 91-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | **(Vx40 + K1x30+K2x30)/100** | | 61 | 59 | 5 |

| Evaluation elements | Maximum points or share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students' workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Final exam (FE) | 100 % | 50-60% | Sufficient (2) | 2 | 30 | 1 |
| | | 61-75% | Good (3) | | | |
| | | 76-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | **(Fex100)/100** | | | | |
| | *** Students who don't pass the partial exams during the semester have to attend the final exam which is 100% of the grade.** | | | | | |

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

| Evaluation elements | Description | Deadline | Compensation |
|---|---|---|---|
| Attendance of lectures and exercise | Students attendance is checked and notified. A justified absence of up to 20% of lectures and 10% of exercises is allowed | semester (105 hours of direct lectures) | - |
| Exercise project | Each exercise is complex (1 par) and performed according to lectures. On the end of the semester student gives all exercises assignments. Some part of exercises assignment is checked during the exercises. | end of semester | |
| Partial exam 1 | All students with absence from lectures and exercise minor than 15% can submit to 1. colloquium. Colloquia consist 30 points and curriculum covered from the lectures and exercises until then. | end of semester | |
| Written and oral exam | Students who did not achieved positive assessment from the exercises and the colloquium (less than 61% of the total score) or are not satisfied with that grade, approach the written and oral exams according to certain examination deadlines. The score obtained on the oral exam is the final grade in the 100% ratio. | In given exam periods | |

# Pathology and wood protection

## Learning Outcomes and Methods of Verification

| Learning Outcomes (LO) | Methods of Verification | Correlation with LO of the Study Program |
|---|---|---|
| Explain which chemical components of the wood structure and how they affect the biological resistance of the wood. | exercises 1 and 2, 1st colloquium, final exam | B2 |

| | | |
|---|---|---|
| Distinguish the biological resistance of the natural durability of wood and define them. | exercises 1 and 2, 1st colloquium, final exam | B2 |
| Analyse and describe the degree of degradation of wood by abiotic factors. | exercises 1 and 2, 1st colloquium, final exam | B2, B4, E1 |
| Differentiate and explain faults in the structure and physical properties of wood resulting from the degradation of abiotic factors from faults caused by biodegradation of wood. | exercises 3 and 4, 2nd colloquium, final exam | B2, B3 |
| Differentiate and explain the bacterial degradation of wood from fungal degradation of wood. | exercises 3 and 4, 2nd colloquium, final exam | B2, B3 |
| Differentiate and explain the faults in the structure and physical properties of wood resulting from the degradation of wood by certain groups (types, species) of wood decaying fungi. | exercises 3 and 4, 2nd colloquium, final exam | B2 |
| Identify and distinguish insects from other arthropods. | exercise 4, 3rd colloquium, final exam | B2, B3 |
| Identify and distinguish between commercially the most important species of xylophagous insects based on morphological images of adult insects. | exercise 4, 3rd colloquium, final exam | B2, B3, E1 |
| Differentiate and describe faults in the structure of wood caused by degradation of certain groups, genera and / or insect species. | exercise 4, 3rd colloquium, final exam | B2, B3, B4, C7, E1 |
| Differentiate and describe faults in the structure of wood caused by the degradation of individual groups, genera and / or species of marine pests. | exercise 4, 3rd colloquium, final exam | B2, E1 |
| Analyse and describe the degree of degradation of wood caused by xylophagous organisms and assess the risk of using such wood in the manufacture of wooden products. | exercises 2 – 4, 3rd colloquium, final exam | B2 |
| Predict the mechanism of degradation of wood in certain use classes. | exercises 2 – 4, 3rd colloquium, final exam | B2 |
| Recommend an appropriate wood protection procedure under the given conditions. | exercises 3 – 7, 3rd colloquium, final exam | B2, B4, E1 |
| Independently write a report and present it in front of a group of people. | Seminar | B2, B3 |

**Grading method = Taking exam**

| Tracking elements | Grading share | Score scale / Grading | Grade | Number of Direct Teaching Hours | Number of working hours of an average student beside direct teaching | ECTS credits |
|---|---|---|---|---|---|---|
| Lectures (L) | – | – | – | 42 | | 1.5 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Making Exercises (E) | 20% | Correct exercises with less than 15 % of acceptable deficiencies | Sufficient (2) | 42 | 63 | 3.5 |
| | | Correct exercises with less than 10 % of acceptable deficiencies | Good (3) | | | |
| | | Correct exercises with less than 5 % of acceptable deficiencies | Very good (4) | | | |
| | | Correct exercises with less than 1 % of acceptable deficiencies | Excellent (5) | | | |
| 1st, 2nd and 3rd Colloquium in written form | 40% | 60-70% | Sufficient (2) | 3 | 30 | 1 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| Final exam – oral exam (OE) or Seminar paper – SEM* | 40% | 60-70% | Sufficient (2) | 3 | 27 | 1 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| | | Seminar paper with less than 8 % of acceptable deficiencies | Very good (4) | 3 | | |
| | | Seminar paper with less than 1 % of acceptable deficiencies | Excellent (5) | | | |
| **TOTAL** | **100%** | **(E×20 + (C1+C2+C3) ×40 + OE×40) / 100 or (E×20 + (C1+C2+C3) ×40 + SEM×40) / 100** | | 90 | 120 | 7 |
| *** students who pass all three colloquia and choose to do seminar papers don't need to complete the final exam; the defended seminar paper changes the final oral exam.** | | | | | | |

| **Tracking elements** | **Maximum points ar grading share** | **Score scale / Grading** | **Grade** | **Number of Direct Teaching Hours** | **Number of working hours of an average student beside direct teaching** | **ECTS credits** |
|---|---|---|---|---|---|---|
| Final Exam* (FE) | 80 % | 60-70% | Sufficient (2) | | 57 | 2 |
| Written part (W) | | 71-80% | Good (3) | | | |
| + | | 81-90% | Very good (4) | | | |
| Oral part (O) | | 91-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | **(E×20 + FE×80) / 100** | | | | |
| *** students who don't pass all three colloquia during the semester have to take final exam consisting of a written and oral part, and they make up to 80 % of the total grade, while the remaining 20 % make a grade of exercises** | | | | | | |

**Advanced reasoned rules of preparation, implementation and taking colloquia, seminar papers, partial exams, written and oral exams:**

| Tracking elements | Description | Deadline | Recoupment |
|---|---|---|---|
| Lectures + Exercises (laboratory work) | The presence of students is checked and recorded during the lectures. A student may justifiably be absent with a maximum of 15% of direct teaching hours. | semester (90 direct teaching hours) | - |
| Making Exercises (E) | Exercises are attended by groups. As part of the exercise, 5 practical exercises are carried out. At the beginning of the first exercise, students will receive templates with the look of the file, inserts and worksheets on which the students will handle and teach their exercises. Each exercise is reviewed twice. If the grade is inadequate or not reviewed, it can be submitted within the probationary period (the student has the right to submit a maximum of two exercises within the probationary period, otherwise the right to sign the course is lost). | according to the agreed delivery dynamics | One probationary period for submitting the exercises for revision. |
| First Colloquium (C1) | The first colloquium contains the following material: hygroscopicity and wood chemistry, natural durability of wood and biological resistance, history of wood protection, abiological degradation of wood.<br>Each colloquium has 20 questions, and each question equals one point.<br>Partially correct answers (semi-points) or negative points does not exist.<br>The minimum number of points for passage the colloquium is 12 (12 of 20 = 60%). | 4th week | - |
| Second Colloquium (C2) | Second colloquium are available to students who have passed the first colloquium.<br>Second colloquium contains the following materials: decaying fungi and bacteria.<br>The minimum number of points for passage the colloquium is 12 (12 of 20 = 60%). | 7th and 13th week | There is a possibility of correctional second colloquium at the time of the third colloquium. |
| Third Colloquium (C3) | Third Colloquium are available to students who have passed the first and second colloquium, as well as students who have passed only the first colloquium but at the same time, they are taking 2nd and 3rd colloquium together.<br>The third colloquium contains the following: xylophagous insects and marine pests, wood protection.<br>Each colloquium has 20 questions, and each question equals one point. Partially correct answers (semi-points) as well as negative points does not exist. The minimum number of points for the passage each colloquium is 12 (12 points of 20 = 60%). All three colloquia are scored with a total of 60 points, with a total minimum of 36 of 60 points being needed for the pass (60%).<br>Students who get enough points from all three colloquia only access the oral part of the exam, and if they successfully defend the seminar paper (the minimum grade is very good (4)), they get a final grade on the subject with no need of taking oral part of the exam.<br>The final grade is the sum of Exercises (E), Colloquia (C1, C2 and C3) and Oral Exam (OE) or Seminar (SEM):<br>**(E×20 + (C1+C2+C3) ×40 + OE×40) / 100 or**<br>**(E×20 + (C1+C2+C3) ×40 + SEM×40) / 100** | 13th week and first examination period | There is a possibility of correctional third Colloquium on the first examination period at the time of the written exam. |
| Seminar paper | Seminar works are available to students who, until the moment of presentation of the conditions of making and theme of seminar papers, do not have a single absence from lectures and from exercises, and have passed the first colloquium.<br>Seminar work is submitted for review by arrangement with the teachers throughout the semester. The final version is submitted to the 14th week and defending in the 14th or 15th week of the semester, provided that the student has passed all three colloquia. A written part of the seminar and | 14th and 15th week | - |

| | | | |
|---|---|---|---|
| | oral presentation are evaluated (defence in front of the whole group of students). Overall rating of the seminar paper should not be less than very good (4) in order to replace the oral exam.<br>The final grade is the sum of Exercises (E), Colloquia (C1, C2 and C3) and Seminar (SEM)<br>**(E×20 + (C1+C2+C3) ×40 + SEM×40) / 100** | | |
| Final exam (FE) written part | The written exam consists of 60 questions, and each question carries one point. Partially correct answers (half-points) and negative points does not exist. The minimum number of points for the passage is 36 (36 of 60 = 60%).<br>After completing the written part of the exam, students have a break (how much is needed for the teacher to review the written assignments) and afterwards (the same day) students that passed written part of exam approach the oral part of exam in groups of two to four students. | examination periods | - |
| Final exam (FE) oral part | The requirement for the oral part of the exam is enough points collected either in colloquia or on the written part of the exam.<br>Practical knowledge of the recognition of biodegradation of wood on 4 samples is required, which is a condition for the further course of the oral part of the exam.<br>After the successful recognition of all four samples, the student is asked two theoretical questions (questions from the least solved colloquium) or three theoretical questions covering entire material. The final grade is obtained according to the formula:<br>**(E×20 + FE×80) / 100** | examination periods | - |

# Sawmilling technology

## Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Distinguish type and quality of oak, beech, fir and spruce sawmilling raw material | Exercises, exam | C2 |
| Distinguish type and quality of oak, beech, fir and spruce sawmilling products | Exercises, exam | C2 |
| Measure the dimensions of the round wood (diameter and length) | Exercises, exam | C2 |
| Calculate individual volumes of round wood shavings based on the measurement of their dimensions (diameter and length) | Exercises, exam | C2 |
| Estimate (calculate) the volume of the stack, or the volume of the round wood in the stack | Exercises, exam | C2 |
| Calculate individual volumes of sawmilling products by measuring their dimensions (thickness, width and length) | Exercises, exam | C2 |
| Estimate the (computed) volume of the stack, or the volume of sawmilling products in the stack | Exercises, exam | C2 |
| Calculation of oversized on sawmilling products | Exercises, exam | C2 |

| | | |
|---|---|---|
| Distinguish types and application of log band saws and resaws | Exercises, exam | C1 |
| Distinguish the types and application of the frame saws | Exercises, exam | C1 |
| Distinguish types and application of circular saws | Exercises, exam | C1 |
| Distinguish types and applications of secondary sawing circular saws specializing in cross-cut sawing | Exercises, exam | C1 |
| Different types and applications of secondary sawing circular saws specializing in rip sawing | Exercises, exam | C1 |
| Link different types of sawing machines to sawmilling technology, | Exercises, exam | C1 |
| Calculate the success of sawing of certain wood species according to the criteria of quantitative yield of round and sawn wood, | Exercises, exam | C2 |
| Calculate the success of sawing of certain wood species according to the criteria of value yield of round and sawn wood | Exercises, exam | C2 |
| Use the basic methods of sawing logs | Exercises, exam | C2 |
| Use the basic methods of sawing the planks | Exercises, exam | C2 |
| Plan and organize day-to-day sawmilling production | Exercises, exam | D1 |

## Methods of grading

| Evaluation elements | Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Lectures (L) | | | | 30 | | 1,5 |
| Exercises (E) | | | | 45 | 45 | 3 |
| Written exam (WE) | 100% | 70-79% | Sufficient (2) | | 30 | 1,5 |
| | | 80-89% | Good (3) | | | |
| | | 90-95% | Very good (4) | | | |
| | | 95-100% | Excellent (5) | | | |
| *Oral exam (OE) | | Percentage of response accuracy ≥70% | Positively | | | |
| | | Percentage of response accuracy <70% | Negative | | | |

| | | | | | |
|---|---|---|---|---|---|
| Total Final exam (FE) | | FE=WE+1 | 75 | 75 | 6 |

* Only those students who want a higher final grade than those obtained on a written exam are issued to the oral exam. The requirement to enter an oral exam is that the score of the written exam is reached in the upper score of the score scale, close to the score of the achieved score. In the case of 70% and more positive answers, the final grade can only be achieved by one step higher than the previously achieved on the written exam.

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

| Evaluation elements | Description | Deadline | Compensation |
|---|---|---|---|
| Attendance of lectures and exercises | The attendance is checked and the attendance of the students is recorded. The student can justifiably absent from the direct teaching as much as stipulated in the Rulebook on Studying. | Semester (75 hours of direct lecturer and exercises) | - |
| Exercises (E) | As part of the exercise, 6 counting exercises and drawings are performed. Students with task assignments and tips for making all 6 exercises, and the appearance of the file, card and inserts are downloaded from the subject's web site. When submitting the exercises, the student should explain how to solve the exercises. | Continuously during the term of the semester according to the agreed term. Students who have created and explained all the exercises and those accepted by the teachers can access the exam. | |
| Written exam | Examinations can be attended by students who have completed, reviewed and explained all exercises. Students on pre-printed exams answer questions asked by rounding off responses, describe images, draw schemes, and solve computational tasks. The written exam is evaluated according to the scale given in the methods of grading. | Exam terms | - |
| *Oral exam | Only those students who want a higher grade than those obtained on a written exam are issued an oral exam. The requirement to enter an oral exam is that the score of the written exam is reached in the upper score of the score scale, close to the score of the achieved score. They ask questions from different parts of the program content. In the case of 70% and more positive answers, only one step higher final grade than the previously achieved on a written exam can be achieved. | Exam terms | - |

# Transport equipment in wood industry

## Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Calculate the basic characteristics of transported materials in the wood industry that are important for transport and storage: volume, mass, density, bulk density, bulk angle, and granulation. | solving computational tasks, partial exams, practical exercises, final oral exam | A1, A4, B4, B5 |
| Analyse influential factors on the basic characteristics of transported materials. | practical exercises, final oral exam | A1, A4, B4, B5 |
| Calculate the required capacity of transport equipment in the woodworking and processing industry: conveyors capacity (belt conveyors, scraper conveyors, elevators, roller conveyors, chain conveyors), cranes and industrial vehicles depending on the parameters of the technical processing of wood | solving computational tasks, partial exams, final oral exam | A1, A4, B4, B5 |
| Evaluate the transport losses expressed in percentage relative to the transported weight | solving computational tasks, partial exams, final oral exam | B4, B5 |
| Calculate the required driving power of the transport equipment in the woodworking process. | solving computational tasks, partial exams, final oral exam | B4, B5 |
| Calculate the dimensions (diameter, cross-sectional area) and select the steel rope and chain components according to the appropriate standards depending on the load weight, rope and chain strength, and load mode. | solving computational tasks, partial exams, practical exercises, final oral exam | B4, B5 |
| Control the operation of the air conveyor system – determine static pressure drop in the system, dynamic pressure, and airflow rate, and calculate the fan's utility and system utility | solving computational tasks, partial exams, practical exercises, final oral exam | A1, A4, B4, B5 |
| Select the ventilator for the air conveyor system depending on the system parameters | solving computational tasks, partial exams, final oral exam | B4, B5 |

## Methods of grading

| Evaluation elements | Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Lectures (L) | - | - | - | 30 | | 1 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Exercises (calculation and practical exercises) | - | - | - | 40 | 5 | 1,5 |
| Active participation in lectures and doing homework (A) | | Collected extra points can increase the positive grade after the exams and the oral exam for one grade | - | - | 5 | 0,2 |
| Self-done exercises (E) | 10% | Partly untidy and incomprehensible, with major corrections and on time | sufficient (2) | - | 10 | 0,3 |
| | | Tidy, comprehensible, with major corrections and on time | good (3) | | | |
| | | Tidy, comprehensible, with minor corrections and on time | very good (4) | | | |
| | | Tidy, comprehensible, without corrections and on time | excellent (5) | | | |
| Partial exams (PE) | 65% | min. 55 % | sufficient (2) | 4 | 40 | 1,5 |
| | | min. 66 % | good (3) | | | |
| | | min. 77 % | very good (4) | | | |
| | | min. 88 % | excellent (5) | | | |
| Oral exam (OE) | 25% | min. 60 % correct answers to the questions asked | sufficient (2) | 1 | 15 | 0,5 |
| | | min. 70 % correct answers | good (3) | | | |
| | | min. 80 % correct answers | very good (4) | | | |
| | | min. 90 % correct answers | excellent (5) | | | |
| **TOTAL** | **100%** | **(Ex10 + PEx65 + OEx25)/100** | | 75 | 75 | 5 |

| **Evaluation elements** | **Share in evaluation** | **Grade rating scale** | **Grade** | **Direct teaching hours** | **Number of average students workload outside the direct teaching** | **ECTS** |
|---|---|---|---|---|---|---|
| Self-done exercises (E) | 10% | Partly untidy and incomprehensible, with major corrections and on time | sufficient (2) | - | 10 | 0,3 |
| | | Tidy, comprehensible, with major corrections and on time | good (3) | | | |
| | | Tidy, comprehensible, with minor corrections and on time | very good (4) | | | |
| | | Tidy, comprehensible, without corrections and on time | excellent (5) | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Final exam (FE) (written and oral) | 90 % | 60-70%<br>71-80%<br>81-90%<br>91-100% | Sufficient (2)<br>Good (3)<br>Very good (4)<br>Excellent (5) | 5 | 55 | 2 |
| **TOTAL** | **100%** | **(FEx90+Ex10)/100** | | | | |

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

| Evaluation elements | Description | Deadline | Compensation |
|---|---|---|---|
| Attendance of lectures and exercises | The attendance of the students is recorded. A student may justifiably be absent with a maximum of 15% of direct teaching hours. | semester (75 direct hours of lectures and exercises) | - |
| Active participation in lectures and doing homework (A) | Students can achieve additional points by solving the assignment tasks and solving the tasks gained in the classroom. The first 3-5 students who send out the correctly solved tasks get additional points. | | |
| Self-done exercises (E) | Exercises are attended by groups. As part of the exercise, students need to create 1 exercise in AutoCAD, 2 calculation exercises and 2 reports on practical exercises. Tasks and necessary materials for doing the reports of exercises should be taken over at Merlin.<br>The accuracy, tidiness, and regularity of doing the exercises are evaluated. | in accordance with the agreed terms | |
| | Students have the opportunity to pass the written part of the exam through 3 partial exams. Each partial exam consists of computational tasks and theoretical questions. The maximum number of points in a single partial exam is 150, a total of 450 on 3 partial exams. | The partial exams take place after 5, 10 15 terms of lectures and exercises | Students who pass partial exams can access the oral exam |
| Final written exam (FE) | Exams can be taken by students who have all self-done exercises and reports from practical exercises. Written exam is taken by students who have not passed partial exams. The written exam consists of 3 calculation tasks, every with 5 points. Students who achieve at least 60% of the written assignments can access the oral exam. | exam schedule | - |
| Oral exam (OE) | Students passing partial exams, or a final written exam can access the oral exam. On oral exam, students are asked questions from different parts of the program content that require understanding and linking of acquired knowledge and application on short problem assignments. The final grade of the subject is obtained according to the formula<br><br>**(Ex10 + PEx65 + OEx25)/100 or (FEx90+Ex10)/100** | exam schedule | |

# Physical and health education 3

## Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|

| | | |
|---|---|---|
| Describe the structure of the physical exercise class. | exercises, correction and evaluation exercises | E1 |
| Explanation of the impact of physical exercise on health. | exercises, correction and evaluation exercises | E1 |
| Choose fitness exercises designed to strengthen individual muscle groups. | exercises, correction and demonstration | E1 |
| Demonstrate specific exercises with regard to kinesiologic activity. | exercises, structural analysis, assistance, correction and evaluation exercises | E1 |
| Organize constructive free time | Exercises and evaluation exercises | E1 |
| Assess personal diet and physical exercise habits. | exercise, diet diary correction and evaluation exercises | E1 |
| Demonstrate general preparatory exercises and stretching exercises. | exercises, description, demonstration, correction | E1 |
| Understanding kinesiology programs and their target orientation. | exercises, description, demonstration, correction | E1 |
| Control emotions and strengthen self-control. | Exercises, correction | E1 |

## Wood constructions

### Learning outcomes and evaluation methods

| Learning outcomes (LO | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Recognition of different wood species, types of wooden and non-wooden materials in the construction of furniture and furnishing. | exercises in computer lab, colloquium, test, final exam | C5 |
| Make a technical drawing of the element and the assembly in terms and cross section according to standards | exercises in computer lab, colloquium, test, final exam | C5 |
| Use technological labels, adhesive joints, mechanical and surface treatments | exercises in computer lab, colloquium, test, final exam | C5 |
| Calculate fits on wooden joints | exercises in computer lab, colloquium, test, final exam | C5 |
| Select characteristic views and cross-sections by determining the position of the cross-sectional plane | exercises in computer lab, colloquium, test, final exam | C5 |
| Apply simple calculations for dimensioning construction elements. | exercises in computer lab, colloquium, test, final exam | C5 |
| Describe and recognize, sketch and technical drawing in orthogonal and | exercises in computer lab, colloquium, test, final exam | C5 |

| | | |
|---|---|---|
| axonometric projection show different construction of assembling wooden structures. | | |
| Distinguish joints and ties and use elements for joining and connecting as well as other fittings in compositions of wooden structures | exercises in computer lab, colloquium, test, final exam | C5 |
| Create basic constrction documentation of furniture and wood products according to the standards | exercises in computer lab, colloquium, test, final exam | C5 |
| Create a simple element and assembly in a 3D CAD program | | C5 |

**Methods of grading**

| Evaluation elements | Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Lectures (L) | - | - | - | 45 | 0 | 1,5 |
| Exercises (E) | 5 % | Partly orderly and understandable, with major improvements required and on time | Sufficient (2) | 45 | 15 | 2 |
| | | Orderly, readable, with major improvements required and on time | Good (3) | | | |
| | | Orderly, readable, with minor improvements required and on time | Very good (4) | | | |
| | | Orderly, readable, accurate and on time | Excellent (5) | | | |
| Colloquium notice in technical drawings (K1) | 20% | 60-70% | Sufficient (2) | 0 | 15 | 0,5 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| Colloquium Constructional forms of assembly (K2) | 20% | 60-70% | Sufficient (2) | 0 | 15 | 0,5 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | 91-100% | Excellent (5) | | | |
| Colloquium Constructional forms of assembly (K3) | 20% | 60-70% | Sufficient (2) | 0 | 30 | 1 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| Colloquium Constructional forms of assembly (K4) | 20% | 60-70% | Sufficient (2) | 15 | 30 | 1 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| Short tests (ST) | **15%** | 50-65% | Sufficient (2) | 0 | 15 | 0,5 |
| | | 66-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | **(Vx5+K1x20+K2x20+K3x20+K4x20+KTx15)/100** | | 90 | 90 | 7 |

| **Evaluation elements** | **Maximum points or share in evaluation** | **Grade rating scale** | **Grade** | **Direct teaching hours** | **Number of average students workload outside the direct teaching** | **ECTS** |
|---|---|---|---|---|---|---|
| Final exam (FE) | 100 % | 61-70% | Sufficient (2) | *3* | *90* | *3* |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | **(ZIx95+Vx5)/100** | | | | |

*** Students who do not pass Colloquium during the semester have to attend the final exam access examination period that makes 95% of the grade, and the remaining 5% is rating from exercises**

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

| Evaluation elements | Description | Deadline | Compensation |
|---|---|---|---|
| Attendance of lectures and exercise | Students attendance is checked and notified. Student can miss 15% of the classes justifiably the most. | semester (90 hours of direct lectures) | - |
| Exercise | Exercises will be performed in 14 separate parts. Before the start of each exercise, students are given exercise forms. Punctuality, tidiness, and regular attendance are evaluated (exercise must be delivered on time). | According to specified date | - |
| Colloquium (K1,K2,K3,K4) | Overall written exam is divided in 4 parts. | K1– 4th week<br>K2 – 8th week<br>K3 – 13th week<br>K4 – 15th week | Students who do not pass Colloquium can take the written exam |
| Short tests | Duration 10 min. From 5 to 10 questions. | before the lecture | |
| Written exam | Students can attend the exam when following conditions are satisfied: Finished and tested exercises, short tests passed. The written exam is evaluated and participates in the final grade of the subject. | In given exam periods | - |
| Oral exam | Students who pass a written exam are asked questions from different parts of the subject content. The final grade of the subject is obtained according to the formula<br><br>**Vx5+KTx15+PIx65+UIx15/100** | | - |

# Wood drying technology

## Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Define the basics of wood anatomy, wood chemistry and other basic properties of wood and their influence on the wood drying process; knowledge of basic units and quantities. | exercises, lectures, exam | C3 |
| Knowledge of the basic properties and characteristics of the most commonly used types of wood in the Republic of Croatia. | exercises, lectures, exam | C3 |
| Explain the theoretical foundations of the wood drying process (seasoning and technical drying). | exercises, lectures, exam | C3 |

| | | |
|---|---|---|
| Knowledge of the basic characteristics of moist air important for the wood drying process. | exercises, lectures, exam | C3 |
| Understand the organization of log yards, raw and dry materials, with regard to microclimatic conditions, related to wood drying. | exercises, lectures, exam | C3 |
| List the methods of measuring the water content in the process of wood drying and explain their industrial application. | exercises, lectures, exam | C3 |
| Distinguish kiln dryers according to the type of process and level of equipment. List and describe the main and auxiliary equipment of the wood kiln dryer. | exercises, lectures, exam | C3 |
| Group and identify wood defects in the drying process to reduce the share of decreased value wood value. | exercises, lectures, exam | C3 |
| Choose the most economical drying method with minimal error (seasoning, technical drying or a combination of both). | exercises, lectures, exam | C3 |
| Control and adjust the wood drying process. | exercises, lectures, exam | C3 |

**Methods of grading=Taking 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 | 30 | 2 |
| Exercises (E) | 20 % | Partly disordered and incomprehensible, with major corrections and on time | Sufficient (2) | 45 | 15 | 2 |
| | | Neat, legible, with major corrections and on time | Good (3) | | | |
| | | Neat, legible, with minor corrections and on time | Very good (4) | | | |
| | | Neat, legible, accurate and on time | Excellent (5) | | | |
| Partial exam (PE) | 80 % | 60-70% | Sufficient (2) | | 30 | 1 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | 91-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | **(Ex20 + PEx80)/100** | | 75 | 75 | 5 |

| **Evaluation elements** | **Maximum points or share in evaluation** | **Grade rating scale** | **Grade** | **Direct teaching hours** | **Number of average students workload outside the direct teaching** | **ECTS** |
|---|---|---|---|---|---|---|
| Final exam (FE) | | 60-70 % | Sufficient (2) | | | 1 |
| | | 71-80 % | Good (3) | | | |
| | | 81-90 % | Very good (4) | | | |
| | | 91-100 | Excellent (5) | | | |
| **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 | The attendance of the students is checked and recorded. Student may justifiably be absent with a maximum of 10 % of direct teaching hours. | semester (75 hours of direct lecturer) | - |
| Exercises | Exercises are attended in groups. At the beginning of the first exercise, students will receive templates. Exercises are written by hand. For each exercise, the term in which the exercise is handed and evaluated positively, is defined. If the exercise is not handed within the defined time frame or if the exercise is not evaluated positively, then that exercise will be reviewed later after semester ends and the student will receive the seminar assignment and additional computational tasks for each exercise. The accuracy, tidiness and regularity are evaluated. | in accordance with the agreed terms | Exceptionally, in the case of a justified reason. |
| Written exam | Exam can be attended by students who have completed the exercises. The exam consists of theoretical questions, computational tasks and of the sample that students must describe. For passage students must collect at least 60 % of points. | Exam terms | - |
| Oral exam | Students who pass a written exam are asked questions from different parts of the program. The final grade of the subject is obtained according to the formula **(FEx80+Ex20)/100** | | - |

# Veneer and veneer plywood

## Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Identification, describe and distinguish veneers according to the type of wood from which they are made | exercises, partial exam, short test, final exam | C4 |
| Identify and describe the technological phases, machines, devices and equipment used in the manufacture of veneers and veneer plywood. | exercises, partial exam, short test, final exam | C4 |
| Choose optimum methods and parameters for making a veneer of greater qualitative and quantitative yield. | exercises, partial exam, short test, final exam | C4 |
| Distinguish the malfunction that arise in the particular technological stages of veneer production and identify the causes of these defects. | exercises, partial exam, short test, final exam | C4 |
| Choose, explain adhesive properties and compare synthetic resins used in the production of veneer plywood. | exercises, partial exam, short test, final exam | C4 |
| Identify different types of veneer plywood and explain their properties. | exercises, partial exam, short test, final exam | C4 |
| Apply the rules for stacking the construction of veneer plywood and determine the optimum construction of the veneer plywood. | exercises, partial exam, short test, final exam | C4 |
| Calculate and choose the appropriate parameters for pressing veneer plywood. | exercises, partial exam, short test, final exam | C4 |
| Differentiate the methods and reasons for the optimization of veneer plywood. | exercises, partial exam, short test, final exam | C4 |

## Methods of grading

| Evaluation elements | Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Lectures (L) | | | | 30 | 0 | 1 |
| Exercises (E) | 5% | Partly disordered and incomprehensible, with major corrections and on time | Sufficient (2) | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | Neat, legible, with bigger corrections and on time | Good (3) | 36 | 0 | 1,2 |
| | | Neat, readable with minor corrections and on time | Very good (4) | | | |
| | | Neat, readable, accurate and timely | Excellent (5) | | | |
| Partial exam – sliced veneer technology (PE1) | 20% | 60-70% | Sufficient (2) | 0 | 15 | 0,5 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| Partial exam - peeled veneer technology (PE2) | 20% | 60-70% | Sufficient (2) | 0 | 15 | 0,5 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| Partial exam - veneer | 20% | 60-70% | Sufficient (2) | 0 | 15 | 0,5 |
| plywood technology (PE3) | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| Calculation partial exam (PE4) | 20% | 60-70% | Sufficient (2) | 9 | 15 | 0,8 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| Short tests (ST) | | 60-70% | Sufficient (2) | 0 | 15 | 0,5 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | **(Ex5+PE1x20+PE2x20+PE3x20+PE4x20+STx15 )/100** | | 75 | 75 | 5 |

| Evaluation elements | Maximum points or Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Final exam (FE) | | 60-70% | Sufficient (2) | | | 2,8 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | **(FEx95+Ex5)/100** | | | | |

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

| Evaluation elements | Description | Deadline | Compensation |
|---|---|---|---|
| Attendance of lectures and exercise | Attendance of students is recorded in classes. A student may justifiably be absent with a maximum of 15% of direct teaching hours. | semester (75 hours of direct lecturer) | - |
| Exercise | Exercises are performed by 10 calculation an 2 laboratory exercises. Before starting the exercises, students will receive training forms. At the end of each exercise, students receive tasks to control the acquired knowledge. The accuracy, precision and the time when the exercise is delivered is evaluated. | According to the appointed time | - |
| | | | |
| Partial exam (PE1, PE2, PE3) | Partial exam are multiple choice tasks where one or more correct answers are completed. For the correct answer, 3 points are awarded, and for the wrong answer 2 points are deducted. | K1 – 4. week<br>K2 – 8. week<br>K3 – 13.week | - |
| Partial exam (PE4) | Calculation tasks | 15. week | - |
| Short tests | Duration 15 min. 5 to 10 questions. | Before the beginning of the lecture | - |
| Written exam | Exam can be accessed by students who have completed exercises and passed short tests. Pre-printed exams round off accurate answers and solve calculation tasks. The written exam is evaluated and participates in the final grade of the course | 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 course is obtained according to the formula<br><br>**Ex5+STx15+WEx65+OEx15/100** | | |

# Glues and wood gluing

## Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Explain the basic theory of adhesion present in wood gluing; | partial or final exam | C6 |
| Distinguish and categorize glue according to source of raw material, hardening method (thermosetting and thermoplastic adhesive groups), and usage (constructive and nonconstructive purposes); | partial or final exam | C6 |
| Repeat the measurement of the basic adhesive properties such as viscosity, density and solid content and explain their significance for the bonding process; | laboratory exercises, corrections, and exercises evaluation | C6 |
| To know, check and control glue factors, substrates, and bond formation processes; | exercises reports, corrections, and exercises evaluation | C6 |
| Suggest the type of adhesive for each material and application of the adhesive assembly; | partial or final exam | C6 |
| Explain the anatomy of the bonded joint, distinguish the factors of strength and durability and formulate their impact on product quality; | exercises reports, corrections, and exercises evaluation | C6 |
| Evaluate the quality of adhesives according to EN and ISO test methods; | laboratory exercises, corrections, and exercises evaluation | C6 |
| Identify, check and recommend basic adhesion parameters (glue application, application uniformity, pressure and compression temperature) and adhesive technology (type of press, adhesive application machines, machines for intensification of curing ...); | partial or final exam | C6 |

**Methods of grading**

| Evaluation elements | Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Lectures (L) | - | - | - | 30 | 0 | 1 |
| Exercises (E) | 30% | Partly neat and partially accurate, corrected twice and not delivered at time | Sufficient (2) | | | |
| | | Neat, partially accurate, twice corrected and delivered on time | Good (3) | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | Neat, accurate, completed but not delivered on time or Neat, with minor corrections, completed and delivered on time | Very good (4) | 30 | 30 | 1,5 |
| | | Neat, accurate, completed and delivered on time | Excellent (5) | | | |
| 1st Partial exam (PE1) | 35% | 51-64% | Sufficient (2) | 1 | 14 | 0,5 |
| | | 65-77% | Good (3) | | | |
| | | 78-89% | Very good (4) | | | |
| | | 90-100% | Excellent (5) | | | |
| 2nd Partial exam (PE2) | 35% | 51-64% | Sufficient (2) | 1 | 14 | 0,5 |
| | | 65-77% | Good (3) | | | |
| | | 78-89% | Very good (4) | | | |
| | | 90-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | **(E x 30 + PE1 x 35+ PE2 x 35)/100** | | 47 | 58 | 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% | Sufficient (2) | 2 | 28 | 1,5 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | **(FE x 80 + E x 30)/100** | | | | |

**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 presence of students is recorded. The student can justifiably be absent with a maximum of 20% of classes. | semester (30 hours of direct lecturer) | - |

| | | | |
|---|---|---|---|
| Exercise report | Each exercise is reviewed and evaluated. Final grade is the arithmetic mean of the grade of all evaluated exercises.<br>Requirements for accessing the written part of the exams are positively evaluated exercises. | according to Syllabus | Two terms for after deadline delivery |
| 1st Partial exam | The partial exam has a total of 50 points, so 26 points (51%) have to be collected for the passage. | 8. week | - |
| 2nd Partial exam | Only students that passed first Partial exam can access to second one.<br>Each of the 10 questions is scored with 5 points. The two partial exams are scored with a total of 100 points, each with 50 points. A total of 51 points is required for the passage (51%).<br>Students who get enough points from both exam parts get the final subject grade. In that case, they can fix the grade by additional access to the oral part of the exam. The final grade is the average score from both partial exams. Oral verification is not mandatory. | 15. week | - |
| Written exam | Examinations can be attended by students who have evaluated exercises and attended classes.<br>The written exam is evaluated and participates in the final grade of the subject. It consists of 10 questions, each scored with 5 points. For passage it is necessary to have 26 points out of a total of 50 points (51%). | 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 script) is checked, as well as understanding and linking thematic entities. | Exam terms | It is possible to catch up at the next exam terms, the positive result of the exam written at the previous exam term is acceptable |

# Panels from disintegrated wood

## Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| to explain the significance of panels from fragmented and defibrated wood and to identify the basic board types | laboratory and practical classes, colloquium, final exam | C4 |
| to describe, evaluate and select the basic and auxiliar raw materials for panel production | laboratory and practical classes, colloquium, final exam | C4 |
| to analyse phases of technological processes of panel production | laboratory and practical classes, colloquium, final exam | C4 |
| to identify and explain the basic equipment for production depending of specific board type | laboratory and practical classes, colloquium, final exam | C4 |
| to analyse the influence of natural and synthetic overlay materials on panel properties | laboratory and practical classes, colloquium, final exam | C4 |
| to recognize the specificity of boards given their structure and raw material composition and to recommend the potential use of panels | laboratory and practical classes, colloquium, final exam | C4 |

## Methods of grading

| Evaluation elements | Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Lectures (L) | - | - | - | 30 | 0 | 1 |
| Exercises (E) | 20% | Partially disordered and incomprehensible, with major corrections and on time | Sufficient (2) | 45 | 15 | 2 |
| | | Orderly, legible, with major corrections and on time | Good (3) | | | |
| | | Orderly, legible, with minor corrections and on time | Very good (4) | | | |
| | | Orderly, legible and on time | Excellent (5) | | | |
| Colloquium (macroscopic identification of certain board type; PC) | 10% | The student determines the board types with the great aid from the examiner | Sufficient (2) | - | 30 | 1 |
| | | The student determines the board types with the minor aid from the examiner | Good (3) | | | |
| | | The student individually and logically determines the board types with the minor aid from the examiner | Very good (4) | | | |
| | | The student individually and logically determines the board types without the aid from the examiner | Excellent (5) | | | |
| Theoretical colloquiums (TC) | 70% | 50-61% | Sufficient (2) | - | 30 | 1 |
| | | 62-73% | Good (3) | | | |
| | | 74-85% | Very good (4) | | | |
| | | 86-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | **(Ex20 + PCx10 + TCx70)/100** | | 75 | 75 | 5 |

| Evaluation elements | Maximum points or share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Final exam (FE) | 70 % | 60-70% | Sufficient (2) | *2* | *60* | *2* |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | **(FEx70 + PCx10 + Ex20)/100** | | | | |

**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. Student may justifiably be absent with a maximum of 10% of direct teaching hours. | semester (75 hours of direct lecturer) | - |
| Exercises | Exercises are attended in groups. Through exercises, the students are introduced to the properties of raw materials for fragmented wood panels production, and they produce experimental particleboards and determine their properties. In addition, they determine the properties of commercially produced particleboards and fibreboards and perform the comparison to the properties of experimentally produced panels. At the beginning of the first exercise, students receive templates for all exercises; they are acquainted with the details of each exercise, and how to submit the exercises report. The accuracy, legibility and regularity (submission on time) are evaluated. | in accordance with the agreed terms | Exceptionally, in the case of a justified reason, the student is allowed to compensate his/her absence on the individual exercise |
| Colloquium (macroscopic identification of certain board type) | On the basis of the knowledge gained on the exercises and through consultation, the students macroscopically determine the 5 samples of fragmented wood panels. Beside the name of the board, students need to know the basic properties of a certain board type and how and where to use them. The colloquium is evaluated and participates in the final evaluation of the subject. | 15. week | Students who pass the colloquium can access the exam |
| Theoretical colloquiums | Theoretical colloquiums consist of five theoretical questions related to knowledge gained on the lectures and exercises. The students are given the printed colloquiums and they answer the questions asked. Theoretical colloquiums are evaluated and participate in the final grade of the subject. | in accordance with the agreed terms | - |
| Written exam | Only the students which have submitted their exercises reports and have passes the colloquium, can take the final written exam. The students are given the printed exam form and they answer the questions asked. The written exam is evaluated and participates in the final grade of the subject. | Exam terms | - |
| Oral exam | Students that pass the written exam are asked questions from different parts of the program content. The final grade of the subject is obtained according to the formula **(Ex20 + PCx10 + FEx70)/100** | | - |

# Practical work 1

### Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Apply the acquired knowledge and skills to a realistic model of wood products or wood technology process | Practical work report | B4, C4, C5 |
| Solve the given problem under defined conditions and deadlines | Practical work report | B4, C4, C5 |
| To form a sense of personal responsibility for the execution of assigned tasks on more minor demanding projects | Practical work report | B4, C4, C5 |

| | | |
|---|---|---|
| Prepare and organize essential documentation for project development | Practical work report | B4, C4, C5 |
| Make a model or product from wood according to the prepared documentation | Practical work report | B4, C4, C5 |
| Develop three-dimensional dawn on made models or wood products | Practical work report | B4, C4, C5 |
| Prepare a report on the professional project or presentation of the product, material or procedure | Practical work report | B4, C4, C5 |

## Methods of grading

| Evaluation elements | Share in evaluation | Grade rating scale | Grade | Direct teachin g hours | Number of average students workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Total: | | | | 90 | 90 | 3 |

| Evaluation elements | Description | Deadline | Compensation |
|---|---|---|---|
| The work performance of a student during field work | a) High work performance b) Satisfactory work performance c) Weaker performance than expected without justified reasons | | |
| Application of theory in practical work during field teaching | a) It demonstrates the extraordinary skill of applying the theory in practical work b) Recognizes the theoretical framework in practical work c) Does not link the theoretical framework with practical work | | |
| The students skill of solving problems during field work | a) Very skilled in solving problems, innovative and creative b) It is possible to solve the default problem in a familiar way c) Does not show satisfactory problem solving skills | | |
| Ability of a student to make decisions during field work | a) Decides independently, based on thorough analysis of (changing) circumstances b) Decisions are satisfactory in known situations c) It often makes wrong decisions without analysis of the situation | | |
| Ability to collaborate in the team during field | a) Works in line with others, contributes to group relationships and efficiency b) Relationships with others are in accordance with normal circumstances, but does not stand out c) | | |
| teaching | Uncommunicative and withdrawn to the extent of negatively affecting the group | | |
| Communication skills of a student during field work | a) Extremely clear, well-organized and convincing communication, written and spoken b) Satisfying skills of written and spoken communication c) Poor writing skills and speech communication | | |

| | | | |
|---|---|---|---|
| Motivation and responsibility of a student during field work | a) High degree of motivation in work and collective and social responsibility b) Satisfactory motivation for work and accountability c) Poor motivated, uninterested and lack of sense of responsibility towards the job | | |

## Physical and health education 4

### Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Describe the structure of the physical exercise class. | exercises, correction and evaluation exercises | E1 |
| Explanation of the impact of physical exercise on health. | exercises, correction and evaluation exercises | E1 |
| Choose fitness exercises designed to strengthen individual muscle groups. | exercises, correction and demonstration | E1 |
| Demonstrate specific exercises with regard to kinesiologic activity. | exercises, structural analysis, assistance, correction and evaluation exercises | E1 |
| Organize constructive free time | Exercises and evaluation exercises | E1 |
| Assess personal diet and physical exercise habits. | exercise, diet diary correction and evaluation exercises | E1 |
| Demonstrate general preparatory exercises and stretching exercises. | exercises, description, demonstration, correction | E1 |
| Understanding kinesiology programs and their target orientation. | exercises, description, demonstration, correction | E1 |
| Control emotions and strengthen self-control. | Exercises, correction | E1 |

## Production Organization

### Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Define the basic concepts of organizational science. | exercises, tests, exam | D1 |

| | | |
|---|---|---|
| Recognize the organizational and technological specifics of production in wood processing and furniture manufacturing. | exercises, tests, exam | D1 |
| Plan and analyse the study of time. | exercises, tests, exam | D1 |
| Review and recommend streamlining of work. | exercises, tests, exam | D1 |
| Identify the characteristic production processes in wood processing. | exercises, tests, exam | D1 |
| Distinguish processes in research and development and propose the development of new products. | exercises, tests, exam | D1 |
| Distinguish processes in procurement, storage and logistics, plan procurement, recommend a procurement model and manage procurement and storage. | exercises, tests, exam | D1 |
| Evaluate the capacities of technological processes. | exercises, tests, exam | D1 |
| Use the principles of designing technological systems in industrial wood processing. | exercises, tests, exam | D1 |
| Organize production, manage production processes. | exercises, tests, exam | D1 |

## Methods of grading=Taking 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) | - | - | - | 45 | 0 | 1,5 |
| Exercises (E) | 10% | Partly disordered and incomprehensible, with major corrections and on time | Sufficient (2) | 45 | 45 | 3 |
| | | Neat, legible, with major corrections and on time | Good (3) | | | |
| | | Neat, legible, with minor corrections and on time | Very good (4) | | | |
| | | Neat, legible, accurate and on time | Excellent (5) | | | |
| Test 1 (T1) | 45% | 60-70% | Sufficient (2) | 1 | 37,5 | 1,25 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | 91-100% | Excellent (5) | | | |
| Test 2 (T2) | 45% | 60-70% | Sufficient (2) | 1 | 37,5 | 1,25 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| | | 60-70% | Sufficient (2) | | | |
| **TOTAL** | **100 %** | **(Ex10 + T1x45 + T2x45 )/100** | | 90 | 120 | 7 |

| **Evaluation elements** | **Maximum points or Share in evaluation** | **Grade rating scale** | **Grade** | **Direct teaching hours** | **Number of average students workload outside the direct teaching** | **ECTS** |
|---|---|---|---|---|---|---|
| Final exam (FE) | | 60-70 % | Sufficient (2) | 3 | 75 | 2,5 |
| | | 71-80 % | Good (3) | | | |
| | | 81-90 % | Very good (4) | | | |
| | | 91-100 | Excellent (5) | | | |
| **TOTAL** | **100 %** | **(FEx90+Ex10)/100** | | | | |

*** Students who during the semester do not pass the subject by a written test shall attend the exam, that makes 90% of the grade, and the remaining 10% make a grade out of the exercise.**

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

| **Evaluation elements** | **Description** | **Deadline** | **Compensation** |
|---|---|---|---|
| Attendance of lectures and exercises | The attendance of the students are checked and recorded. Student may justifiably be absent with a maximum of 15 % of direct teaching hours. | semester (90 hours of direct lecturer) | - |
| Exercises | Exercises are attended in groups. For each exercise, students receive individual templates - tasks. The deadline for the exercise is two weeks and if the exercise is not timely submitted and the positive evaluation is not obtained, the student gets an additional task. The accuracy, tidiness and regularity of exercise are evaluated (time-honoured exercises). | in accordance with the agreed terms | Exceptionally, in the case of a justified reason. |
| Test 1 | Students who have a positive assessment of the first five exercises and who have not abstained from teaching more than 15% can access the first test. Test 50% comprise the knowledge acquired in lectures (theory), and 50% on the knowledge acquired exercises (tasks). | 8th week | Students who pass the first test can access the second test. |
| Test 2 | Students who have a positive assessment of all exercises and who have not abstained from teaching more than 15% can access the second test. Test 50% comprise the knowledge acquired in lectures (theory), and 50% on the knowledge acquired exercises (tasks). | 15th week | Students who pass 1st and 2nd test are exempted from the exam. |

| | | | |
|---|---|---|---|
| Written exam | Students who have a positive assessment of all exercises can attend the exam. The exam consists of three computational tasks. The written exam is evaluated and participates in the final grade of the subject. | Exam terms | - |
| Oral exam | Students who pass a written exam are asked questions from different parts of the program. The final grade of the subject is obtained according to the formula **Ex10+EEIx45+ OEx45/100** | | - |

# Final wood processing

### Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Explain the basic concepts about the technological processes of final wood processing | partial or final exam | C6 |
| Distinguish and categorize basic final products (eg chair, bed, table, wardrobe etc); | partial or final exam | C6 |
| Evaluate, draw up a budget and recommend the quantity of wood and non-woven materials needed for the production of certain final products or elements of final products; | laboratory exercises, corrections, and exercises evaluation | C6 |
| Identify, describe and choose the most technologically acceptable (optimal) formatting (cutting) of wood elements in the production of final products; | exercises reports, corrections, and exercises evaluation | C6 |
| Design the order of joining assemblies and assemblies, and the order of assembling elements into a finished product; | partial or final exam | C6 |
| Use basic measuring equipment e.g. measuring strip, calliper, micrometre, comparator and line for measuring dimensions and processing accuracy and to know the working principle of modern measuring instruments such as 3D scanners; | exercises reports, corrections, and exercises evaluation | C6 |
| Identify and distinguish factors that have the greatest impact on the quality of a particular wood processing; | laboratory exercises, corrections, and exercises evaluation | C6 |
| Evaluate the possibilities of applying new technologies and technological processes with respect to the production program and existing manufacturing technology of the company; | partial or final exam | C6 |

## Methods of grading

| Evaluation elements | Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Lectures (L) | - | - | - | 45 | 0 | 1,5 |
| Exercises (E) | 20% | Partly neat and partially accurate, corrected twice and not delivered at time | Sufficient (2) | 45 | 45 | 3,5 |
| | | Neat, partially accurate, twice corrected and delivered on time | Good (3) | | | |
| | | Neat, accurate, completed but not delivered on time or Neat, with minor corrections, completed and delivered on time | Very good (4) | | | |
| | | Neat, accurate, completed and delivered on time | Excellent (5) | | | |
| 1st Partial exam (PE1) | 40% | 51-64% | Sufficient (2) | 1 | 21,5 | 0,75 |
| | | 65-77% | Good (3) | | | |
| | | 78-89% | Very good (4) | | | |
| | | 90-100% | Excellent (5) | | | |
| 2nd Partial exam (PE2) | 40% | 51-64% | Sufficient (2) | 1 | 21,5 | 0,75 |
| | | 65-77% | Good (3) | | | |
| | | 78-89% | Very good (4) | | | |
| | | 90-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | **(E x 20 + PE1 x 40+ PE2 x 40)/100** | | 92 | 88 | 6 |

| Evaluation elements | Maximum points or Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Final exam (FE) | 80 % | 60-70% | Sufficient (2) | 2 | 43 | 1,5 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | **(FE x 80 + E x 20)/100** | | | | |

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

| Evaluation elements | Description | Deadline | Compensation |
|---|---|---|---|
| Attendance of lectures and exercises | The attendance is checked, and the presence of students is recorded. The student can justifiably be absent with a maximum of 20% of classes. | semester (45 hours of direct lecturer) | - |
| Exercise report | Each exercise is reviewed and evaluated. Final grade is the arithmetic mean of the grade of all evaluated exercises. Requirements for accessing the written part of the exams are positively evaluated exercises. | according to Syllabus | Two terms for after deadline delivery |
| 1st Partial exam | The partial exam has a total of 50 points, so 26 points (51%) have to be collected for the passage. | 8. week | - |
| 2nd Partial exam | Only students that passed first Partial exam can access to second one. Each of the 10 questions is scored with 5 points. The two partial exams are scored with a total of 100 points, each with 50 points. A total of 51 points is required for the passage (51%). Students who get enough points from both exam parts get the final subject grade. In that case, they can fix the grade by additional access to the oral part of the exam. The final grade is the average score from both partial exams. Oral verification is not mandatory. | 15. week | - |
| Written exam | Examinations can be attended by students who have evaluated exercises and attended classes. The written exam is evaluated and participates in the final grade of the subject. It consists of 10 questions, each scored with 5 points. For passage it is necessary to have 26 points out of a total of 50 points (51%). | 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 script) is checked, as well as understanding and linking thematic entities. | Exam terms | It is possible to catch up at the next exam terms, the positive result of the exam written at the previous exam term is acceptable |

# Basic statistics

## Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Identify and distinguish numeric and categorical variable types (continuous, discrete, dichotomous, nominal, ordinal). Choose the appropriate graphs. Create a frequency table. Calculate the central tendency measures and analyse them. Calculate variability measures and analyse them. Calculate median and quartiles and analyse them. | Hand calculation exercises, Partial exams, Written and Oral Exam | A1 |
| Apply the basics of probability. Calculate probabilities. | Hand calculation exercises, Partial exams, Written and Oral Exam | A1 |

| | | |
|---|---|---|
| Differentiate, sketch and apply theoretical distribution: normal, T and binomial distribution. | Hand calculation exercises, Partial exams, Written and Oral Exam | A1 |
| Apply different sampling methods: a random, stratified, systematic sample. Know the main essence of the central boundary theorem and the standard error. | Hand calculation exercises, Partial exams, Written and Oral Exam | A1 |
| Estimate (point estimate) the arithmetic mean, the standard deviation and the proportions of the population | Hand calculation exercises, Partial exams, Written and Oral Exam | A1 |
| Calculate and interpret the interval estimate of the arithmetic mean, the standard deviation and the proportions of the population. | Hand calculation exercises, Partial exams, Written and Oral Exam | A1 |
| Calculate, draw and interpret individual index numbers. | Hand calculation exercises, Partial exams, Written and Oral Exam | A1 |
| Interpret and draw the linear trend equation Calculate the prediction using a linear trend equation. | Hand calculation exercises, Partial exams, Written and Oral Exam | A1 |

**Methods of grading**

| Evaluation elements | Maximum points or Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Lectures | - | | - | 30 | 15 | 1,5 |
| Exercies | - | - | - | 30 | 30 | 2 |
| Partial exams | 100% | 65-74 | Sufficient (2) | 4 | 15 | 0,5 |
| | | 75-84 | Good (3) | | | |
| | | 85-94 | Very good (4) | | | |
| | | 95-100 | Excellent (5) | | | |
| Final exam | 100% | 60-70 | Sufficient (2) | 3 | | |
| | | 71-80 | Good (3) | | | |
| | | 81-90 | Very good (4) | | | |
| | | 91-100 | Excellent (5) | | | |

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

| Evaluation elements | Description | Deadline | Compensation |
|---|---|---|---|
| Attendance of lectures and exercises | The attendance of students on lectures and exercises is checked. The student may not attend a maximum of 4 hours of lecture classes and 4 hours of. Exercises. The student have to submit correctly solved 5 exercises. | semester (60 hours of direct lecturer) | - |
| Partial exams | During the course, students write two partial exams each with 5 tasks total 100 (2 * 50) points. The minimum number of points that can be obtained by the partial exam is 20. If they collect at least 65 points in two partial exams, they can pass exam without the final exam. | During the semester | |
| Written exam | Exams can be accessed by students who have received a signature. The written part of the exam consists of 5 tasks totalling 100 points. | Exam terms | |
| Oral exam | Students who have passed the written part of the exam access the oral exam. | Exam terms | |

# Wood in construction

## Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Identify the prominent families of wood construction products and connect their end-use requirements with design and construction types and material properties | exam | B3 |
| To appoint and explain the ecological features of wood as a building material, the importance of maintaining its durability and the possibilities of wood recycling. | exam | C7 |
| To explain the dimensional and structural limitations of wood and propose and evaluate their improvement methods (laminating, structural and engineering connections). | exam | B3 |
| To distinguish, group, and argument the technical properties of wood essential for construction, explain and evaluate the aesthetic, economic and traditional values of wood for construction. | exam | B2 |
| To identify, explain and group factors of durability and risk classes to the durability of construction products and wood buildings and suggest and design the measures to overcome these risks | practice exercises, exam | C6, C7 |

| | | |
|---|---|---|
| To adapt or design a set of details and measures of integral (physical, structural, surface and biological) protection of a simple wood building or wood construction product | practice exercises, exam | C6, C7 |
| Connect the type of window and door with basic functional requirements, connect the details into a functional unit, and design and illustrate the final product. | practice exercises, exam | C6, C7 |
| To describe types of wood floor coverings and connect the product type with the basic technical properties and functional requirements | exam | C8 |

**Methods of grading**

| Evaluation elements | Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Lectures (L) | - | - | - | 30 | 0 | 1 |
| Exercises (E) | 25% | Mostly inaccurate, with major corrections | Sufficient (2) | 30 | 15 | 1,5 |
| | | Mostly accurate, with corrections | Good (3) | | | |
| | | Exact, with minor corrections | Very good (4) | | | |
| | | Accurate and error-free | Excellent (5) | | | |
| Exam (PE) | 75% | 60-70% | Sufficient (2) | | 45 | 1,5 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | **(Lxy0+Exy0 + PExy0)/100** | | 60 | 60 | 4 |

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

| | | |
|---|---|---|
| **TOTAL** | **100%** | **(FExy0+Exy0)/100** |

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

| Evaluation elements | Description | Deadline | Compensation |
|---|---|---|---|
| Attendance of lectures and exercises | The attendance is checked and recorded. Exercises are attended by groups. A student may justifiably be absent with a maximum of 15% of direct teaching hours. | semester (60 hours of direct lecturer) | - |
| Partial exam | Exercises are organised in groups. As part of the exercise, 6 practical exercises from the topic of physical and structural protection of wood, surface stability and technological construction of wood construction products are performed. At the beginning of the first exercise, students are introduced to the rules of preparation, teaching, and assessment of exercises. | 15. week | |
| | **The accuracy, regularity, and regularity (time-honoured exercises)** | | |
| Written exam | The exam can be attended by students whose exercises were evaluated positively. The written exam is evaluated and participates in the final grade of the subject. | Exam terms | |
| Oral exam | Students get questions from different part of the subject program. Final mark of subject is achieved from the formula: **Ex5+C1x5+C2x15+Ex75/100** | | |

# Marketing of wood products

**Learning outcomes and evaluation methods**

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| To carry out a market research process using the customer survey methodology and to evaluate the demand for wood products based on the derived consumption method | Exercises evaluation, partial exams, final exam | D2 |
| To decide about marketing strategies in woodworking and furniture manufacturing companies and design strategic product planning processes | Exercises evaluation, partial exams, final exam | D2 |
| To establish a business portfolio of business attractiveness business and business power of companies and to create a multifactor portfolio matrix | Exercises evaluation, partial exams, final exam | D2 |
| To plan the life span of the best-selling products in the production program | Exercises evaluation, partial exams, final exam | D2 |

| | | |
|---|---|---|
| To create a product marketing strategy at each stage of the product life cycle | Exercises evaluation, partial exams, final exam | D2 |
| To analyse wood products customers' behaviour based on information in the recent years | Exercises evaluation, partial exams, final exam | D2 |
| To develop a market prediction of furniture sales and to plan furniture consumption based on the determined quantity of products sold in the past period | Exercises evaluation, partial exams, final exam | D2 |
| To design wood products and furniture distribution channels and to recommend the application of the appropriate distribution channels | Exercises evaluation, partial exams, final exam | D2 |
| To suggest cost allocation concerning stages in the product development process and form the price of a particular product based on price and competitiveness | Exercises evaluation, partial exams, final exam | D2 |
| To develop a promotional plan for a wood industry company | Exercises evaluation, partial exams, final exam | D2 |
| To assess the most common business, merchandise and financial risks in industry company and to suggest transportation documentation for wood products | Exercises evaluation, partial exams, final exam | D2 |

**Methods of grading**

| Evaluation elements | Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Lectures (L) | - | - | - | 30 | 0 | 1 |
| Exercises (E) | 20% | Partly orderly and understandable, with major improvements required and on time | Sufficient (2) | 28 | 30 | 2 |
| | | Orderly, readable, with major improvements required and on time | Good (3) | | | |
| | | Orderly, readable, with minor improvements required and on time | Very good (4) | | | |
| | | Orderly, readable, accurate and on time | Excellent (5) | | | |
| Partial exam 1 (PE1) | 40% | 51-70% | Sufficient (2) | 1 | 15 | 0,5 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Partial exam 2 (PE2) | 40% | 51-70% | Sufficient (2) | 1 | 15 | 0,5 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | **(E20 + PE1x40+PE2x40)/100** | | 60 | 60 | 4 |

| **Evaluation elements** | **Maximum points or Share in evaluation** | **Grade rating scale** | **Grade** | **Direct teaching hours** | **Number of average students workload outside the direct teaching** | **ECTS bodovi** |
|---|---|---|---|---|---|---|
| Final exam (FE) | 100 % | 60-70% | Sufficient (2) | 2 | 30 | 1 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | **(FE100)/100** | | | | |

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

| **Evaluation elements** | **Description** | **Deadline** | **Compensation** |
|---|---|---|---|
| Attendance of lectures and exercises | Students attendance is checked and notified. Student can miss 15% of the classes justifiably the most. | semester (60 hours of direct lecturer) | - |
| | Exercises are made individually. As part of the exercise, 10 individual tasks are performed (one of 10 exercises, exercise 5 is done in the form of seminar work and is presented in the last term of teaching, before the 2nd semester)<br>At the beginning of the first exercise, students are provided with instructions on how to perform the exercises and the appearance of the collar, liner and insertion sheet in which they will print in the form. The accuracy, regularity and regularity (time-honoured exercises)<br>Exercises carry 50 points. | According to a time schedule | |
| Partial exam I | First partial exam can be attended by students who did not miss more than 15% of lectures and exercises. and who have corrected and signed exercises 1-5. The 1. Partial exam is 100 points, and it covers the issues regarding until the time of partial exam. | 6th. week | |
| Partial exam II | Second partial exam can be attended by students who did not miss more than 15% of lectures and exercises. and who have corrected and signed exercises 1-10 and | 13th. week | |
| | who have accomplished more than 50 points in the partial exam I. The II. Partial exam is 100 points. | | |
| Written exam | Students who did not receive a positive assessment from the exercise and the partial exams (less than 51% of the total score) or are not satisfied with a final grade will approach the written exams according to certain examination deadlines. The written exam consists of 3-4 assignments (depending on the complexity of the assignment, with each assignment max number of points) | Exam terms | |

| | | | |
|---|---|---|---|
| Oral exam | The requirement for the oral exam is 51 % on the written exam. The score obtained on the oral exam is the final grade in the 100% ratio. Note: The person who passed the exam via partial exams and obtained the right to a final grade, and is not satisfied with the final grade, can access the oral exam, but in that case may score a grade higher than the grade obtained by passing the exam through a partial exam .<br>The grade given on oral exam is final and it makes 100% of the grade. | Exam terms | |

# Practical work 2

### Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Apply the acquired knowledge and skills to a realistic model of wood products or wood technology process | Practical work report | B4, C4, C5, C6, C8 |
| Solve design and technological problems independently or as a team | Practical work report | B4, C4, C5, C6, C8 |
| Develop the ability to recognize variants of wood and non-wood materials and technological processes | Practical work report | B4, C4, C5, C6, C8 |
| Define variants of materials, product construction and technological conditions and processes based on defined criteria | Practical work report | B4, C4, C5, C6, C8 |
| Prepare and organize the primary documentation for the development and presentation of the project | Practical work report | B4, C4, C5, C6, C8 |
| Prepare a product and a report on the professional project; prepare a presentation of a product, material or process; present a product, process or innovation at a conference or exhibition | Practical work report | B4, C4, C5, C6, C8 |

### Methods of grading

| Evaluation elements | Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Total: | | | | 90 | 90 | 3 |

| Evaluation elements | Description | Deadline | Compensation |
|---|---|---|---|
| The work performance of a | a) High work performance b) Satisfactory work performance c) Weaker performance than expected without justified reasons | | |

| | | | |
|---|---|---|---|
| student during field work | | | |
| Application of theory in practical work during field teaching | a) It demonstrates the extraordinary skill of applying the theory in practical work b) Recognizes the theoretical framework in practical work c) Does not link the theoretical framework with practical work | | |
| The student's skill of solving problems during field work | a) Very skilled in solving problems, innovative and creative b) It is possible to solve the default problem in a familiar way c) Does not show satisfactory problem solving skills | | |
| Ability of a student to make decisions during field work | a) Decides independently, based on thorough analysis of (changing) circumstances b) Decisions are satisfactory in known situations c) It often makes wrong decisions without analysis of the situation | | |
| Ability to collaborate in the team during field | a) Works in line with others, contributes to group relationships and efficiency b) Relationships with others are in accordance with normal circumstances, but does not stand out c) | | |
| teaching | Uncommunicative and withdrawn to the extent of negatively affecting the group | | |
| Communication skills of a student during field work | a) Extremely clear, well-organized and convincing communication, written and spoken b) Satisfying skills of written and spoken communication c) Poor writing skills and speech communication | | |
| Motivation and responsibility of a student during field work | a) High degree of motivation in work and collective and social responsibility b) Satisfactory motivation for work and accountability c) Poor motivated, uninterested and lack of sense of responsibility towards the job | | |

# Production planning and calculation

**Learning outcomes and evaluation methods**

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| To analyse and select the profile of the company's wood processing and furniture manufacturing business for possible business collaboration based on calculated and analysed performance and safety performance indicators | Exercises evaluation, partial exams, final exam | D1, D2 |
| To analyse a fundamental principles of financial accounting (Balance Sheet, Profit and Loss Account, Cash Flow Statement) | Exercises evaluation, partial exams, final exam | D1, D2 |
| To recommend the type of calculation and to calculate a cost price per unit in wood processing | Exercises evaluation, partial exams, final exam | D1, D2 |
| To recommend the type of calculation and to calculate a cost price per unit in furniture manufacturing | Exercises evaluation, partial exams, final exam | D1, D2 |

| | | |
|---|---|---|
| To create a cost price per one unit of wood produces and furniture by applying calculation incomplete costs calculation method | Exercises evaluation, partial exams, final exam | D1, D2 |
| To suggest a method of calculating depreciation as a specific expense of fixed assets | Exercises evaluation, partial exams, final exam | D1, D2 |
| To calculate productivity cost (contribution margin) of selected wood products in wood processing and furniture manufacturing companies | Exercises evaluation, partial exams, final exam | D1, D2 |
| To plan production costs classification in relation to changes in the scope of production activities (fixed costs, variable costs, mixed costs, discretionary costs) | Exercises evaluation, partial exams, final exam | D1, D2 |
| To plan production costs classification according to their natural characteristics (staff costs, material costs, depreciation, service costs, non-material / other costs, financing costs) | Exercises evaluation, partial exams, final exam | D1, D2 |
| To create a relationship model of costs, revenue and change of business activity | Exercises evaluation, partial exams, final exam | D1, D2 |
| To analyse the cost structure of the company and determine cost-related priorities and evaluate the type of calculations that the company applies in forming the cost of the product's cost and decide which type of calculation would be most applicable to the company being monitored. | Exercises evaluation, partial exams, final exam | D1, D2 |
| To select loan repayment models in wood processing and furniture manufacturing companies | Exercises evaluation, partial exams, final exam | D1, D2 |

**Methods of grading**

| Evaluation elements | Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Lectures (L) | - | - | - | 30 | 0 | 1 |
| Exercises (E) | 20% | Partly orderly and understandable, with major improvements required and on time | Sufficient (2) | 43 | 15 | 1,5 |
| | | Orderly, readable, with major improvements required and on time | Good (3) | | | |
| | | Orderly, readable, with minor improvements required and on time | Very good (4) | | | |
| | | Orderly, readable, accurate and on time | Excellent (5) | | | |
| Seminar paper (SP) | 5% | Partly orderly and understandable, with major improvements required and on | Sufficient (2) | - | 5 | 0,5 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | time | | | | |
| | | Orderly, readable, with major improvements required and on time | Good (3) | | | |
| | | Orderly, readable, with minor improvements required and on time | Very good (4) | | | |
| | | Orderly, readable, accurate and on time | Excellent (5) | | | |
| Partial exam 1 (PE1) | 40% | 51-70% | Sufficient (2) | 1 | 30 | 1 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| Partial exam 2 (PE2) | 40% | 51-70% | Sufficient (2) | 1 | 30 | 1 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | **(E20 + PE1x40+PE2x40)/100** | | 75 | 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** |
|---|---|---|---|---|---|---|
| Final exam (FE) | 100 % | 60-70% | Sufficient (2) | 2 | 30 | 1 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | **(FE100)/100** | | | | |

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

| **Evaluation elements** | **Description** | **Deadline** | **Compensation** |
|---|---|---|---|
| Attendance of lectures and exercises | Students attendance is checked and notified. Student can miss 15% of the classes justifiably the most. | semester (60 hours of direct lecturer) | - |
| | Exercises are made individually. As part of the exercise, 10 individual tasks are performed (one of 10 exercises, exercise 5 is | According to a time schedule | |

| | | | |
|---|---|---|---|
| | done in the form of seminar work and is presented in the last term of teaching, before the 2nd semester)<br>At the beginning of the first exercise, students are provided with instructions on how to perform the exercises and the appearance of the collar, liner and insertion sheet in which they will print in the form. The accuracy, regularity and regularity (time-honoured exercises)<br>Exercises carry 50 points. | | |
| Partial exam I | First partial exam can be attended by students who did not miss more than 15% of lectures and exercises. and who have corrected and signed exercises 1-5. The 1. Partial exam is 100 points, and it covers the issues<br>regarding until the time of partial exam. | 7th. week | |
| Partial exam II | Second partial exam can be attended by students who did not miss more than 15% of lectures and exercises, who have corrected and signed exercises 1-10 and who accomplished more than 50 points in the partial exam I. The II. Partial exam is 100 points. | 15th. week | |
| Written exam | Students who did not receive a positive assessment from the exercise and the partial exams (less than 51% of the total score) or are not satisfied with a final grade will approach the written exams according to certain examination deadlines. The written exam consists of 3-4 assignments (depending on the complexity of the assignment, with each assignment max number of points) | Exam terms | |
| Oral exam | The requirement for the oral exam is 51 % on the written exam. The score obtained on the oral exam is the final grade in the 100% ratio. Note: The person who passed the exam via partial exams and obtained the right to a final grade, and is not satisfied with the final grade, can access the oral exam, but in that case may score a grade higher than the grade obtained by passing the exam through a partial exam .<br><br>The grade given on oral exam is final and it makes 100% of the grade. | Exam terms | |

# Wood finishing

### Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Differentiate the sanding materials for various types of wood, wood materials, wood finishes according to backing, abrasive grain and grain's hardness and toughness, grit size and amount of grains. | laboratory exercises, midterm exams, exam | A1, A4, B4, C8, E1 |
| Differentiate the properties and composition of wood staining materials (water-based stains, alcohol-based stains, oil stains, reactive stains and wood bleaching materials. | laboratory exercises, midterm exams, exam | A1, A4, B4, C8, E1 |
| Compare the properties of a wood coatings based on natural resins, oils and waxes, with coatings based on synthetic resins. | laboratory exercises, midterm exams, exam | A1, A4, B4, C8, E1 |

| | | | |
|---|---|---|---|
| Identify the advantages and disadvantages of certain methods of applying varnishes (manual application, applying by spraying, curtain coating, dipping, roller coating, flow coating, vacuum coating). | laboratory exercises, exams, exam | midterm | A1, A4, B4, C8, E1 |
| Measure the viscosity of the wood coating material, density, dry solid, the film thickness, application rate. | laboratory exercises, exams, exam | midterm | A1, A4, B4, C8, E1 |
| To compare the methods of curing (drying) coatings on wood (convection drying, infrared radiation, microwaves, UV radiation, electron beam irradiation). | laboratory exercises, exams, exam | midterm | A1, A4, B4, C8, E1 |
| Calculate the consumption of wood finishing materials | laboratory exercises, exams, exam | midterm | A1, A4, B4, C8, E1 |
| To evaluate the safety and health risks in the finishing room (explosiveness, flammability, health hazard, danger to the environment). | laboratory exercises, exams, exam | midterm | A1, A4, B4, C8, E1 |
| Write professional paper on a given topic in the field of wood finishing. | seminars | | A1, A4, B4, C8, E1 |

**Methods of grading**

| Evaluation elements | Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Lectures (L) | - | | - | 30 | 0 | 1 |
| Exercises (E) | 12 % | 1 point for each task (worksheet) that was submitted on time, 4 points for project task | - | 45 | 15 | 2 |
| Partial exam (PE) | 30 % | Students can achieve a maximum of 30 points. To gain access to the second partial exam must achieve a minimum of 15 points. | - | 1 | 15 | 0,5 |
| Partial exam (PE) | 30 % | Students can achieve a maximum of 30 points. | - | 1 | 15 | 0,5 |
| Homework | 4 % | 1 point for each homework that was submitted on time | - | - | 4 | 0,1 |
| Seminar paper | 20 % | The maximum possible number of points scored is 20 | - | - | 22 | 0,8 |
| Presentation of seminar paper | 4 % | 4 points for a held presentation | - | - | 4 | 0,1 |
| **TOTAL** | **100%** | From all the elements of monitoring and checking the student can achieve a maximum height of assessment of 100 | - | 77 | 75 | 5 |
| | | points, which makes 100 % of the grade. For the passing grade, the student must have a | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | minimum of 50 points or 50 % of the grades. Scale rating is as follows: | | | | |
| | | 50 – 60 % | Sufficient (2) | | | |
| | | 61 -75 % | Good (3) | | | |
| | | 76 – 90 % | Very good (4) | | | |
| | | 91 – 100 % | Excellent (5) | | | |

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

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

| Evaluation elements | Description | Deadline | Compensation |
|---|---|---|---|
| Attendance of lectures and exercises | The attendance of the students is recorded. Students are allowed 20 % absence from lectures and 10 % from exercises. Exercises are attending in groups. Exercises tasks are submitted within a predefined time limit, and timely delivery of the correct work sheets is scored. | semester | - |
| Submission of worksheets from laboratory work (excercises) | Exercises are attended in groups. Students must submit worksheets in a predefined period of time and timely submitted worksheets are scored. | According to weekly class schedule | - |
| Partial exams | There are two partial exams. Each brings 30 points. At the first partial exam a student must achieve at least 50 % to gain access to second partial exam. | VIII week XV week | - |
| Seminar paper | Students choose the theme of the seminar work from the proposed themes in MERLIN. Seminars are scored according to the given criteria. | XIII; XIV week | - |
| Presentation | By presenting a seminar, the student receives four additional points | XII; XIV week | - |
| Homework | Each on-time delivered homework brings 1 point | According to weekly class schedule | - |
| Written exam | A student who failed to pass an examination by continuous collection of points during the semester has the right to attend the exam. Prior to exam seminar paper and exercise worksheets must be submitted for review. | Exam terms | - |
| Oral exam | Prerequisite for oral exam is minimum score of 50 in written exam | Exam terms | - |

# Practice

## Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Apply the acquired knowledge and skills gained during the study in specific situations | Practical work report | A4, B4, B5, C1, C2, C3, C4, C8, D2 |
| Apply communication skills in a new work environment | Practical work report | A4, B4, B5, C1, C2, C3, C4, C8, D2 |
| Record and comment on characteristics of working procedures, wood product production and business | Practical work report | A4, B4, B5, C1, C2, C3, C4, C8, D2 |
| Compare the success of wood production according to the given criteria | Practical work report | A4, B4, B5, C1, C2, C3, C4, C8, D2 |
| To form a sense of responsibility and motivation for the execution of assigned tasks | Practical work report | A4, B4, B5, C1, C2, C3, C4, C8, D2 |
| Prepare a written report on professional practice | Practical work report | A4, B4, B5, C1, C2, C3, C4, C8, D2 |

## Methods of grading

| Evaluation elements | Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Total: | | | | 80 | 80 | 3 |

| Evaluation elements | Description | Deadline | Compensation |
|---|---|---|---|
| The work performance of a student during field work | a) High work performance b) Satisfactory work performance c) Weaker performance than expected without justified reasons | | |
| Application of theory in practical work during field teaching | a) It demonstrates the extraordinary skill of applying the theory in practical work b) Recognizes the theoretical framework in practical work c) Does not link the theoretical framework with practical work | | |
| The student's skill of solving problems during field work | a) Very skilled in solving problems, innovative and creative b) It is possible to solve the default problem in a familiar way c) Does not show satisfactory problem solving skills | | |
| Ability of a student to make decisions during field work | a) Decides independently, based on thorough analysis of (changing) circumstances b) Decisions are satisfactory in known situations c) It often makes wrong decisions without analysis of the situation | | |

| | | | |
|---|---|---|---|
| Ability to collaborate in the team during field | a) Works in line with others, contributes to group relationships and efficiency b) Relationships with others are in accordance with normal circumstances, but does not stand out c) | | |
| teaching | Uncommunicative and withdrawn to the extent of negatively affecting the group | | |
| Communication skills of a student during field work | a) Extremely clear, well-organized and convincing communication, written and spoken b) Satisfying skills of written and spoken communication c) Poor writing skills and speech communication | | |
| Motivation and responsibility of a student during field work | a) High degree of motivation in work and collective and social responsibility b) Satisfactory motivation for work and accountability c) Poor motivated, uninterested and lack of sense of responsibility towards the job | | |

# Operations Management I

### Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Define production functions and production strategies | Project assignment, oral exam | D1 |
| Analyse concepts for planning and production management | Exercises in computer practicum, project assignment, seminar work, oral exam | D1 |
| Prepare the technical documentation | Exercises in computer practicum, project assignment, seminar work, oral exam | D1 |
| Organize technological, operational preparation of production and distribution of jobs | Exercises in computer practicum, project assignment, written and oral exam | D1 |
| Connect documentation of business and manufacturing systems companies wood processing and furniture production | Exercises in computer practicum, project assignment, written and oral exam | D1 |
| Modelling production process management systems in a wood processing and furniture manufacturing company | Exercises in Computer Practice, Project Task, Oral Exam | D1 |
| Recommend a software solution for integrated production planning and management | Project assignment, seminar work, oral exam | D1 |
| Apply the acquired knowledge and skills from the content of the course items to solve a specific task | Project assignment, seminar work, oral exam | D1 |

## Methods of grading

| Evaluation elements | Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Lectures (L) | - | - | - | 28 | 0 | 1 |
| Exercises (E) | 25% | Partly disordered and incomprehensible, with major corrections and on time | Sufficient (2) | 28 | 0 | 1 |
| | | Clean, easy, with bigger corrections and on time | Good (3) | | | |
| | | Clean, easy, with minor corrections and on time | Very good (4) | | | |
| | | Clean, easy, accurate and timely | Excellent (5) | | | |
| Seminar paper (SP) | 5% | The student is exhibiting with the help of the examiner | Sufficient (2) | 4 | 10 | 0,5 |
| | | Student Exposes Using Examiner | Good (3) | | | |
| | | It is self-explanatory and logical with little help from the examiner | Very good (4) | | | |
| | | Self-explanatory and logical, without any help | Excellent (5) | | | |
| Final exam (FE) | 70% | 60-70% | Sufficient (2) | 0 | 15 | 0,5 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | **(Vx25 + Sx5+Ix70)/100** | | 60 | 25 | 3 |

| Evaluation elements | Maximum points or Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS bodovi |
|---|---|---|---|---|---|---|
| Final exam (FE) | 100% | 60-70% | Sufficient (2) | *5* | *15* | *0,7* |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | **(FEx 100) / 100** | | | | |

## Detailed description of evaluation elements for lecturer, seminars, excercises and final exams:

| Evaluation elements | Description | Deadline | Compensation |
|---|---|---|---|
| Lectures + 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 (60 hours of direct lecturer) | - |
| Exercises | • Exercises are attended by groups.<br>• 4 project individual tasks are performed within the exercise.<br>• n the introductory lecture, students will receive instructions on the layout of the exercises - the folder, the jumper and the proposal sheet, in which they will correspond to the set tasks in printed form.<br>• At the beginning of the exercise, students will receive templates for project assignments. Exercises are surrendered gradually after each course.<br>• The accuracy, regularity and regularity are evaluated (time-honoured exercises)<br>• Exercises carry 25 points and together with exam scores make up 100 points. | According to the agreed terms | Exceptionally, in the case of a justified reason, student does the absence of a single exercise |
| Seminars | • Seminar work is done independently<br>• At the beginning of the third lecture, students receive topics that are electronically chosen, and instructions and literature related to the work<br>• In the last lecture, each student presents an independent seminar work<br>• Questions are raised from the parts of the seminar work | 15 week | |
| Partial exam | • Exam can be attended by students who have completed, submitted and corrected exercises.<br>• Students on pre-made exams to solve the task. | Exam terms | - |
| | • Written Exam (We) is evaluated and participates 20% in the final grade of the subject | | |
| Written exam | • Students who pass a written exam are asked for oral questions from different parts of the subject's program content.<br>• The oral exam (Uispt) participates 50% in the final grade of the subject • The total rating is calculated according to the formula: (E x 25+ S x 5+ We x 20 + Oe x 50) / 100 | Exam terms | - |

# Technological properties of wood

## Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Determining the influence of physical and mechanical properties of wood on technological characteristics of wood processing | Exercises evaluation, partial exams, final exam | A1, A4, B1, B3 |
| Determining the impact of wood defects on technological characteristics of wood processing | Exercises evaluation, partial exams, final exam | A1, A4, B1, B3 |
| Determining the basic technological characteristics of wood important for certain types of mechanical wood processing | Exercises evaluation, partial exams, final exam | A1, A4, B1, B3 |
| Evaluation of technological characteristics of wood for certain types of mechanical wood processing | Exercises evaluation, partial exams, final exam | A1, A4, B1, B3 |
| Practical recognition of technological characteristics of domestic and foreign types of wood | Exercises evaluation, partial exams, final exam | A1, A4, B1, B3 |
| Evaluation of wood types according to technological characteristics of wood | Exercises evaluation, partial exams, final exam | A1, A4, B1, B3 |

## Methods of grading

| Evaluation elements | Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Lectures (L) | - | - | - | 30 | 15 | 1,5 |
| Exercises (E) | 70% | Partly orderly and understandable, with major improvements required and on time | Sufficient (2) | 30 | 0 | 1 |
| | | Orderly, readable, with major improvements required and on time | Good (3) | | | |
| | | Orderly, readable, with minor improvements required and on time | Very good (4) | | | |
| | | Orderly, readable, accurate and on time | Excellent (5) | | | |
| Partial exam 1 (PE1) | 30% | 61-70% | Sufficient (2) | 1 | 14 | 0,5 |
| | | 71-80% | Good (3) | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | **(Ex70 + PE1x30)/100** | | 61 | 29 | 3 |

| **Evaluation elements** | **Maximum points or Share in evaluation** | **Grade rating scale** | **Grade** | **Direct teaching hours** | **Number of average students' workload outside the direct teaching** | **ECTS** |
|---|---|---|---|---|---|---|
| Final exam (FE) | 100 % | 60-70% | Sufficient (2) | 2 | 30 | 1 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | **(Fex100)/100** | | | | |

*** students who don't pass the partial exams during the semester have to attend the final exam which is 100% of the grade.**

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

| **Evaluation elements** | **Description** | **Deadline** | **Compensation** |
|---|---|---|---|
| Attendance of lectures and exercise | Students attendance is checked and notified. Student can miss 15% of the classes justifiably the most. | semester (60 hours of direct lectures) | - |
| Exercise project | Exercises are given in groups and student make exercise project individually. Each project is complex (1 project) and it is made in parts corresponding to teaching parts. Student presents the whole project at the end of semester, and each part is evaluated on lectures during the semester. | end of semester | |
| Partial exam 1 | First partial exam can be attended by students who did not miss more than 15% of lectures and exercises. | end of semester | |
| Written and oral exam | Students who did not pass the subject through partial exams and exercise project (less the 61% of points), or who are not satisfied with the grade, can attend the final oral exam in given exam periods. The grade given on oral exam is final and it makes 100% of the grade. | In given exam periods | |

# Woodworking machinery II

## Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Suggest optimum tool-tip material (high speed steel, hard alloy, hard metal, or diamond) for the default workpiece material and processing parameters. | seminar, final exam | C1 |
| Suggest optimum processing parameters (feed speed, cutting speed ...) for basic woodworking processes. | seminar, final exam | C1 |
| Calculate the energy efficiency of a particular processing method as the ratio of average energy consumed in kWh and unit quantity of processed material. | seminar, final exam | C1 |
| Comment the results of measured and calculated operating regimes for mechanical woodworking machines with reference to the recommended values. | seminar, final exam | C1 |
| Measure feed per tooth, feed per revolution and cutting speed on band saw, circular saw, planer, moulder, drill, and report the measurement results as a report. | seminar, final exam | C1 |
| Distinguish the causes of tool wear and the tool's sharpness reduction. | seminar, final exam | C1 |
| Analyse the influential factors on tool life according to Taylor and suggest ways of increasing the tool life under the processing conditions. | seminar, final exam | C1 |
| Derive the formula for the calculation of the cutting force, cutting power and theoretical roughness in wood cutting | seminar, final exam | C1 |
| Calculate the cutting speed and tool life for the optimum productivity, analyse influencing parameters, and suggest the economic cutting speed | seminar, final exam | C1 |
| Differentiate the evaluation criteria of wood machinability for different species of wood processed on band saws, circular saws, planers, mills, lathes, drills. | seminar, final exam | C1 |
| Illustrate and measure basic parameters which make up the technical criteria for selection of woodworking machines. | seminar, final exam | C1 |

## Methods of grading

| Evaluation elements | Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Lectures (L) | - | - | - | 30 | 0 | 1 |
| Exercises and seminar (E) | 50% | 50-60% | Sufficient (2) | 30 | 20 | 1 |
| | | 61-75% | Good (3) | | | |
| | | 76-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| Final exam (FE) | 50% | 50-60% | Sufficient (2) | - | 30 | 1 |
| | | 61-75% | Good (3) | | | |
| | | 76-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| **UKUPNO** | **100%** | **(Ex50 + FEx50)/100** | | **60** | **60** | **3** |

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

| Evaluation elements | Description | Deadline | Compensation |
|---|---|---|---|
| Attendance of lectures and exercises | The attendance is checked and the attendance of the students is recorded. A student may justifiably be absent with a maximum of 15% of direct teaching hours. | semester (60 hours of direct lecturer) | - |
| Exercises (E) | Exercise exercises include auditing exercises that handle numerical tasks related to individual chapters and laboratory measurements of key parameters for the optimization of the performance on a particular machine and determination of optimal parameters according to the calculation and recommendations of the tool and machine manufacturer, and methodology of noise and vibration measurements on woodworking machines. Exercises are, as appropriate, attended by groups.<br>The accuracy, regularity and regularity are evaluated. Along with the regularity of lectures and exercises, the lecture and exercise report is delivered in the form of a seminar and is a condition for oral exam. | According to the agreed terms | Exceptionally, in the case of a justified reason for the students absence from the individual laboratory exercise. |
| Oral exam | The requirement for the oral part of the exam is a passing grade from the seminars and reports from laboratory exercises. Theoretical knowledge. understanding and detailed examination of the subjects studied in the lectures, is checked. | Exam terms | |

# Furniture construction

## Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| To identify and describe furniture construction, to classify (kitchen furniture, dining room furniture, office and school etc.) and to identify furniture (whose main features are visual, aesthetic and functional elements and inner construction and functional structure) and to use technical terms (rail, panel, hinge etc) | final examination | C4, C5 |
| To design, draw and describe furniture for storage, dining and work, sitting and lying by way of conceiving stage (analysing tasks and dealing with the issue of constructing ), designing (selecting the best variant and making a drawing) and by constructional elaboration to parts and assemblies. | exercises in the computer classroom, corrections, exercise evaluation, final examination | C5 |
| To design storage furniture, furniture for work, sitting and lying and in accordance with ergonomic and anthropometric principles and HRN EN standards. | exercises in the computer classroom, corrections and exercise evaluation | C5 |
| To draw up the basic construction documentation and to approach systematically to its completion. | exercises in the computer classroom, corrections and exercise evaluation | C5 |
| Define and sketch furniture for people with disabilities, outdoor furniture and paper and cardboard furniture. | final examination | C5 |
| To use CAD systems for making technical drawings or drawings as data carriers in relation to product shape, construction and quality. | exercises in the computer classroom, corrections and exercise evaluation | C5 |
| To deal with calculations for the construction of different furniture types (to dimension construction) | exercises in the computer classroom, corrections and exercise evaluation | C5 |
| To manage the equipping of a facility with furniture for storage, dining, work, sitting and lying. | final examination | C5 |
| Recognize and describe quality factors of processed types of furniture | exercises in the computer classroom, corrections, exercise evaluation, final examination | C5 |
| Recognize and distinguish between connecting fittings and other types of furniture fittings, | exercises in the computer classroom, | C5 |

| | |
|---|---|
| | corrections and exercise evaluation |

**Methods of grading**

| Evaluation elements | Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Lectures (L) | - | - | - | 30 | 0 | 1 |
| Exercises (E) | 34 % | Partly neat and partly correct, corrected twice, not submitted on time | Sufficient (2) | 30 | 15 | 1,5 |
| | | Neat and partly correct, corrected twice, submitted on time | Good (3) | | | |
| | | Neat, correct, complete, not submitted on time<br>Neat with minor corrections, complete and submitted on time | Very good (4) | | | |
| | | Neat, correct, complete, submitted on time | Excellent (5) | | | |
| Written exam (WE) | 34 % | 60-70% | Sufficient (2) | 0 | 3 | 0,10 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| Oral exam (OE) | 33 % | 60-69% | Sufficient (2) | 0 | 12 | 0,40 |
| | | 70-79% | Good (3) | | | |
| | | 80-89% | Very good (4) | | | |
| | | 90-100% | Excellent (5) | | | |
| **TOTAL** | **100 %** | **(E×34 + WE×33 + OE×33) / 100** | | 60 | 30 | 3 |

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

| Evaluation elements | Description | Deadline | Compensation |
|---|---|---|---|
| Lectures (L) | Student' attendance is checked and recorded. Student may be absent from no more than 20% of lectures. | according to syllabus | - |
| Exercises (E) | Student' attendance is checked and recorded. Student may be absent from no more than 10% of exercises. | according to syllabus | - |

| | | | |
|---|---|---|---|
| | Exercises are checked and graded. The grade for exercises is the arithmetic mean of grades for individual exercise grades.<br>The requirements for taking the written examination are positively graded exercises. | | |
| Written exam (WE) | Students whose exercises have been graded and who regularly attended classes may take the examination.<br>Students randomly choose an assignment with the product photograph or given parameters for drawing and designing. Orthogonal projections and characteristic sections are drawn freehandedly, and the component and technical description are filled on forms prepared beforehand.<br>The written examination is graded and included in the final grade . | Exam terms | - |
| Oral exam (OE) | A requirement for taking the oral examination is to acquire sufficient scores in the written part of the examination. Students' theoretical knowledge and understanding of constructional compositions are examined.<br>The final grade will be calculated by the formula<br>: **(E×30 + WE×35 + OE×35) / 100** | Exam terms | - |

# Upholstered Furniture

## Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| To identify historic periods, styles and development of upholstered furniture | final examination | A1 |
| To design and construct types of upholstered furniture intended for sitting, lying and for multiple purposes (resting and relaxation) | exercises in the computer classroom, corrections, exercise evaluation | C5 |
| To distinguish and recommend materials for making upholstered furniture (such as for making the frame construction, for the elastic layer, for decorative-covering layer…) | final examination | C5 |
| To choose materials for the frame construction; for the base of furniture for siting and lying; for the elastic layer i.e. the core; for surface softness and for the decorative covering layer: | exercises in the computer classroom, corrections, exercise evaluation, final examination | B3, C5 |
| To design furniture and plan its manufacture depending on available technology (classical (hand), machine made, construction technology of mattress…) | final examination | C5 |
| To draw a contemporary construction of upholstered furniture for sitting and lying | exercises in the computer classroom, corrections, exercise evaluation, final examination | C5 |
| To define and apply functional requirements for upholstered furniture | final examination | C5 |
| To plan, recommend and assess upholstered furniture quality | final examination | D1 |

| | | |
|---|---|---|
| To differ stages of the technological process of upholstered furniture manufacturing (eg. when producing mattresses, to recognise the process of making the mattress core, making outer layers etc.) | final examination | C5 |
| To recognise the types (quality) of sponge materials (eg. the difference between viscoelastic foam and latex, differences in density (hardness) of polyurethane sponges, etc.) and the flammability resistance of upholstered furniture. | final examination | C5 |

**Methods of grading**

| Evaluation elements | Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Lectures (L) | - | - | - | 30 | 0 | 1 |
| Exercises (E) | 50 % | Partly neat and partly correct, corrected twice, not submitted on time | Sufficient (2) | 30 | 15 | 1,5 |
| | | Neat and partly correct, corrected twice, submitted on time | Good (3) | | | |
| | | Neat, correct, complete, not submitted on time | Very good (4) | | | |
| | | Neat with minor corrections, complete and submitted on time | | | | |
| | | Neat, correct, complete, submitted on time | Excellent (5) | | | |
| Oral exam (OE) | 50 % | 60-70% | Sufficient (2) | 0 | 15 | 0,5 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| **TOTAL** | **100 %** | **(E×50 + OE×50) / 100** | | 60 | 30 | 3 |

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

| Evaluation elements | Description | Deadline | Compensation |
|---|---|---|---|
| Lectures (L) | Student' attendance is checked and recorded. Student may be absent from no more than 20% of lectures. | according to syllabus | - |
| Exercises (E) | Student' attendance is checked and recorded. Student may be absent from no more than 10% of exercises.<br>Exercises are checked and graded. The grade for exercises is the arithmetic mean of grades for individual exercise grades. | according to syllabus | - |

| | | | |
|---|---|---|---|
| | Seminar and exercises are checked and graded. The grade for the practical part (seminar and exercises) is the arithmetic mean f the seminar and individual exercise grades.<br>The requirements for taking the examination are positively graded exercises and the seminar. | | |
| Oral examination (OE) | Students whose exercises and seminar have been graded and who regularly attended classes may take the examination. Students' theoretical knowledge and understanding of certain construction compositions will be examined. The final grade will be calculated by the formula: **(E×50 + OE×50) / 100** | Exam terms | - |

# Furniture design

## Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods | Connection with the study program LO |
|---|---|---|
| Recognize and apply the characteristics of historical styles and heritage in furniture design | exercises (project assignment, seminar work) | C4, C8<br>E1 |
| Compare and monitor contemporary trends and innovations in furniture design (internet, magazines, books) in the context of economic development, culture, heritage and social, developmental and historical factors of each nation and apply them in designing new furniture design solutions | exercises (project assignment, seminar work) | A1<br>E1 |
| Explain the importance of an interdisciplinary approach and the inclusion of knowledge of other professions in furniture design | exercises (project assignment), final exam | A1<br>E1 |
| Recognize and explain the term good design using the parameters of good design | exercises (project assignment, seminar work), final exam | B3<br>C4, C5, C8<br>E1 |
| Design and shape furniture and other wooden products using design elements (means of expression) and the principles of modern design (functional, aesthetic, technical-technological, human, economic, environmental principles, etc.) or according to given characteristics (input data) | exercises (project assignment, seminar work), final exam | B3, B4<br>C4, C5, C8<br>E1 |
| Use innovations and new materials and technologies in designing conceptual furniture solutions on a given topic | exercises (project assignment, seminar work), final exam | B3<br>C4, C5, C8<br>E1 |
| Apply knowledge of aesthetics, ergonomics, anthropometry, ecology, standards, new materials, and technologies, marketing and visual identity in the design of furniture and other wood products | exercises (project assignment, seminar work), final exam | A1<br>D2 |

| | | |
|---|---|---|
| Define design-functional, construction-technological and other characteristics of the executive design of furniture | exercises (project assignment, seminar work), final exam | B3, B4<br>C4, C5, C8<br>E1 |
| Apply knowledge of design drawing (spatial and / or, computer) and workshop work (professional practice) in the development of conceptual and implementation solutions for designed furniture | exercises (project assignment, seminar work) | A1, A4 |
| Present the solution of designed furniture in all stages of product development with the final model/prototype in the design of furniture and other wood products | exercises (project assignment, seminar work) | B3, B4<br>C4, C5, C8<br>E1 |

**Methods of grading**

| Evaluation elements | Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Lectures (L) | 0 | | | 30 | 0 | 1 |
| Exercises (E) | 90% | Partial understanding of the adopted subject, poor student activity and the quality of the project task solution. | Sufficient (2) | 30 | 25 | 1,8 |
| | | Partial understanding of the adopted subject, good student activity and quality of the project task solution. | Good (3) | | | |
| | | Very well applied and adopted material, very good student activity and quality of the project task solution. | Very good (4) | | | |
| | | Exceptional engagement, excellent applied and adopted material, excellent student activity and the quality of the project task solution. | Excellent (5) | | | |
| Oral exam (OE) | 10% | 60-70% | Sufficient (2) | 0 | 5 | 0,2 |
| | | 71-80% | Good (3) | | | |
| | | 81-90% | Very good (4) | | | |
| | | 91-100% | Excellent (5) | | | |
| **TOTAL** | **100%** | **(E×90 + OE×10) / 100** | | 60 | 30 | 3 |

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

| Evaluation elements | Description | Deadline | Compensation |
|---|---|---|---|
| Lectures | The attendance is checked, and the presence of students is recorded. The student can justifiably be absent with a maximum of 20% of the tuition. | according to syllabus | |
| Excercises | The exercises are checked and recorded by the presence of students. The student can justifiably absent with a maximum of 10% of the exercise. During the semester, the student prepares exercises / tasks in team and individual work, monitoring continuous student progress and adopting thematic knowledge and skills, in accordance with the evaluation criteria. The right to sign is obtained by the number of attendance classes and exercises as well as assignments and seminars within the given deadline. It is obligatory to submit each phase of the project task to insight. Submission of the project task is by deadline, by the end of the semester. | according the syllabus | |
| Oral exam | Requirements for the oral part of the exams are devoted and positively evaluated exercises project assignment, all other assignments and seminar papers. The oral exam consists of verbal defence (presentation) of the project task solution and the understanding of all phases of designing the conceptual and execution solution in the project assignment as well as the understanding and adoption of knowledge in lectures and exercises. The final grade is obtained according to the formula: (V × 90 + + UI × 10) / 100 | exam terms | |

# Bachelor thesis

## Learning outcomes and evaluation methods

| Learning outcomes (LO) | Evaluation methods |
|---|---|
| be able to apply existing knowledge to solve professional problems for the selected topic | Undergraduate thesis |
| create a term work plan following the set deadlines for the preparation of the bachelor thesis by components | Undergraduate thesis |
| devise a methodology for writing a professional or review paper | Undergraduate thesis |
| apply the methodology of writing a professional or review paper | Undergraduate thesis |
| present bachelor thesis in written and oral form | Undergraduate thesis<br>defence of undergraduate thesis |

## Methods of grading

| Evaluation elements | Share in evaluation | Grade rating scale | Grade | Direct teaching hours | Number of average students workload outside the direct teaching | ECTS |
|---|---|---|---|---|---|---|
| Undergraduate thesis (UT) | 70% | See description | Sufficient (2) | | 150 | 5 |
| | | | Good (3) | | | |
| | | | Very good (4) | | | |
| | | | Excellent (5) | | | |
| Defence of undergraduate thesis (UD) | 30% | See description | Sufficient (2) | | 60 | 3 |
| | | | Good (3) | | | |
| | | | Very good (4) | | | |
| | | | Excellent (5) | | | |
| **TOTAL** | **100%** | | | | 210 | 8 |

| Evaluation elements | Description | Deadline | Compensation |
|---|---|---|---|
| Undergraduate thesis (UT) | sufficient (2) - There are substantial deficiencies in the work, the basic concepts are superficial and no deeper knowledge of the subject good (3) - Only some of the relevant aspects of the topic are presented in this paper, the literature is processed correctly but only partially. The scientific and professional vocabulary is basic<br>very good (4) - The work is well-structured with facts, relevant theories and up-to-date data are presented, the literature is correctly elaborated, but the approach lacks creativity. excellent (5) - The work is logically well structured factually correct and conceptually well-defined, the entities are related, the relevant and recent literature is used and the approach to the topic from different perspectives is visible. | | - |
| Defence of undergraduate thesis (UD) | sufficient (2) - The presentation is a retelling of the read text, the answers to the questions are scarce.<br>good (3) - The presentation is clear and informative, but without the ability to link theory to practice. Ability to answer only simple questions. very good (4) - The presentation is clear and substantive, the answers to the questions are just correct and do not indicate a deeper reflection on the topic.<br>excellent (5) - The presentation is clear, highly informative, answers the questions right and creative. | | |