

Syllabus

Course Description

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| Course Title | Mechanics of Structures |
| Course Code | 42637 |
| Course Title Additional | |
| Scientific-Disciplinary Sector | CEAR-06/A |
| Language | German |
| Degree Course | Professional Bachelor in Wood Technology |
| Other Degree Courses (Loaned) | |
| Lecturers | Dott. Thomas Franz Xaver Moosbrugger, ThomasFranzXaver.Moosbrugger@unibz.it https://www.unibz.it/en/faculties/engineering/academic-staff/person/42499 |
| Teaching Assistant | |
| Semester | First semester |
| Course Year/s | 2 |
| CP | 4 |
| Teaching Hours | 40 |
| Lab Hours | 0 |
| Individual Study Hours | 60 |
| Planned Office Hours | 12 |
| Contents Summary | <ol style="list-style-type: none">1. mechanics<ol style="list-style-type: none">a. Equilibrium of forcesb. Internal forces for single-span beams2. modeling of structures<ol style="list-style-type: none">a. Modeling of load-bearing structuresb. Solid wall girders vs. truss girders3. material science4. stress determination<ol style="list-style-type: none">a. Bending, tensile stress and compressive stress5. carpentry constructions6. engineered timber construction |

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| | <p>7. fundamentals of structural design EC 0</p> <p>8. actions according to EC 1</p> <p>a. Load distribution (g, p, s, w)</p> <p>b. Load combination</p> <p>9. principles of design according to EC 5</p> <p>a. ULS: normal stresses, bending stresses and shear stresses</p> <p>b. SLS: Deformation</p> <p>10. fasteners in timber construction</p> <p>a. Dowels, offsets, nails, screws and adhesive joints</p> <p>11. special beam shapes for bending</p> <p>a. Gable roof beams, beams with variable cross-sectional height and composite cross-sections</p> <p>12. columns</p> <p>a. Single-member and multi-member</p> <p>13. load-bearing systems</p> <p>a. Frame joints and three-hinge systems</p> <p>14. timber-concrete composite</p> <p>15. basics of concrete construction incl. connections to the foundation.</p> |
| Course Topics | Elaboration of the fundamentals for the design of timber structures based on the basic mechanical principles of elastostatics. Insight into the essential standards of Eurocode 0, 1, and 5. |
| Keywords | Statics, structural design, ULS and SLS verification, timber construction |
| Recommended Prerequisites | None. |
| Propaedeutic Courses | |
| Teaching Format | Face-to-face teaching with practical examples. |
| Mandatory Attendance | Recommended. |
| Specific Educational Objectives and Learning Outcomes | <p>The course aims to teach participants the basic formal relationships of structural design, primarily in timber construction, and practical methods for solving problems in these contexts.</p> <p>Knowledge and understanding:</p> <ul style="list-style-type: none"> • Understanding of the basic design concept for load-bearing structures - based on limit states - and the necessity of safety factors. • Basic knowledge of modeling buildings and load-bearing structures in structural engineering. |

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| | <p>Applying knowledge and understanding:</p> <ul style="list-style-type: none"> • Basic knowledge of real load-bearing behavior and necessary simplified model approaches • Application of theoretical content through exercises, case studies and project work as well as understanding the problems presented. Theoretical content is illustrated by means of calculation exercises using practical examples. <p>Making judgments:</p> <ul style="list-style-type: none"> • Based on what they have learned, students are able to describe the function of real load-bearing systems. <p>Communication skills:</p> <ul style="list-style-type: none"> • The students are able to actively participate in subject-specific discussions using the specific terminology based on what they have learned. <p>Learning skills</p> <ul style="list-style-type: none"> • Students learn the subject matter both through frontal teaching (theoretical part) and through exercises in the lecture hall (practical exercises) • Students are able to expand their acquired knowledge through self-taught self-study and consultation of scientific and technical texts. |
| Specific Educational Objectives and Learning Outcomes (additional info.) | |
| Assessment | Oral examination (small group with written preparation). |
| Evaluation Criteria | The assessment is based on a single final mark. The final mark is determined 100% from the results of the oral examination in the small group. Criteria for the assessment: correctness of the answers, impression of the presentation in the context of answering subject-specific questions. |
| Required Readings | Personally prepared transcript of the lecturer's lecture notes and study sheets. |
| Supplementary Readings | Colling, F.: Holzbau: <i>Grundlagen und Bemessung nach EC 5</i> , |

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| | <p>Springer Vieweg; Auflage: 5., überarb. und akt. Aufl. 2016 (7. Oktober 2016), ISBN-10: 3658142324</p> <p>Niemz, P., Sonderegger, Walter, U.: 2011, <i>Physik des Holzes</i>. Hanser Fachbuchverlag, ISBN 978-3-446-876 44526-0, doi:10.3139/9783446445468.</p> <p>ÖNORM EN 1995-1-1 2019 06 01: <i>Eurocode 5: Bemessung und Konstruktion von Holzbauten - Teil 1-1: Allgemeines - Allgemeine Regeln und Regeln für den Hochbau (konsolidierte Fassung)</i>, 2019.</p> |
| Further Information | |
| Sustainable Development Goals (SDGs) | Industry, innovation and infrastructure |