

Syllabus

Course Description

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 forces b. Internal forces for single-span beams 2. modeling of structures <ol style="list-style-type: none"> a. Modeling of load-bearing structures b. Solid wall girders vs. truss girders 3. material science 4. stress determination <ol style="list-style-type: none"> a. Bending, tensile stress and compressive stress 5. carpentry constructions 6. engineered timber construction

	<ul style="list-style-type: none"> 7. fundamentals of structural design EC 0 8. actions according to EC 1 <ul style="list-style-type: none"> a. Load distribution (g, p, s, w) b. Load combination 9. principles of design according to EC 5 <ul style="list-style-type: none"> a. ULS: normal stresses, bending stresses and shear stresses b. SLS: Deformation 10. fasteners in timber construction <ul style="list-style-type: none"> a. Dowels, offsets, nails, screws and adhesive joints 11. special beam shapes for bending <ul style="list-style-type: none"> a. Gable roof beams, beams with variable cross-sectional height and composite cross-sections 12. columns <ul style="list-style-type: none"> a. Single-member and multi-member 13. load-bearing systems <ul style="list-style-type: none"> a. Frame joints and three-hinge systems 14. timber-concrete composite 15. basics of concrete construction incl. connections to the foundation.
Course Topics	<p>Elaboration of the fundamentals for the design of timber structures based on the basic mechanical principles of elastostatics.</p> <p>Insight into the essential standards of Eurocode 0, 1, and 5.</p>
Keywords	<p>Statics, structural design, ULS and SLS verification, timber construction</p>
Recommended Prerequisites	<p>None.</p>
Propaedeutic Courses	
Teaching Format	<p>Face-to-face teaching with practical examples.</p>
Mandatory Attendance	<p>Recommended.</p>
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.

	<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	<p>The assessment is based on a single final mark.</p> <p>The final mark is determined 100% from the results of the oral examination in the small group.</p> <p>Criteria for the assessment: correctness of the answers, impression of the presentation in the context of answering subject-specific questions.</p>
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> ,

	<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