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	1. mechanics a. Equilibrium of forces b. Internal forces for single-span beams 2. modeling of structures a. Modeling of load-bearing structures b. Solid wall girders vs. truss girders 3. material science 4. stress determination a. Bending, tensile stress and compressive stress 5. carpentry construtctions 6. engineered timber construction

	7. fundamentals of structural design EC 0 8. actions according to EC 1 a. Load distribution (g, p, s, w) b. Load combination 9. principles of design according to EC 5 a. ULS: normal stresses, bending stresses and shear stresses b. SLS: Deformation 10. fasteners in timber construction a. Dowels, offsets, nails, screws and adhesive joints 11. special beam shapes for bending a. Gable roof beams, beams with variable cross-sectional height and composite cross-sections 12. columns a. Single-member and multi-member 13. load-bearing systems a. Frame joints and three-hinge systems 14. timber-concrete composite 15. basics of concrete construction incl. connections to the foundation.
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	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. Knowledge and understanding: • 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.

	Applying knowledge and understanding: • 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. Making judgments: • Based on what they have learned, students are able to describe the function of real load-bearing systems. Communication skills: • The students are able to actively participate in subject-specific discussions using the specific terminology based on what they have learned. Learning skills • 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: *Grundlagen und Bemessung nach EC 5*,

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