Syllabus

Course Description

Course Title	Laboratory of Construction Site 4.0
Course Code	42636
Course Title Additional	
Scientific-Disciplinary Sector	NN
Language	Italian
Degree Course	Professional Bachelor in Wood Technology
Other Degree Courses (Loaned)	
Lecturers	Arch. Gabriele Pasetti Monizza, gabriele.monizza@natec.unibz.it https://www.unibz.it/en/faculties/engineering/academic-staff/person/29017
Teaching Assistant	
Semester	First semester
Course Year/s	2
CP	3
Teaching Hours	0
Lab Hours	30
Individual Study Hours	45
Planned Office Hours	9
Contents Summary	• Timber construction and prefabrication technologies • Industrialization of the supply chain • Process automation • Digital transformation • Production and site management
Course Topics	The course is characterizing and integrative part of the specialization in wood construction. It deals with the topic of digital transformation of processes in constructions with specific reference to the timber industry. Students will apply methods and strategies for the management

	and the control of horizontal and vertical digital processes along the value chain of the timber industry, through the following activities: • Development of a mock-up project according to a use-case of a small Cross Laminated Timber (CLT) house provided by the lecturer. • Development of a digital automation strategy before the production stage of the building elements through Computational Design and Digital Fabrication techniques. • Production of the building elements (scale 1:50) through CNC machinery, evaluating and mapping the whole value chain system through Value Stream Mapping (VSM) technique. • Planning and management of on-site assembly according to Lean Construction principles.
Keywords	Timber technologies, Prefabrication, Digital technologies applied to constructions, Process optimization.
Recommended Prerequisites	None.
Propaedeutic Courses	
Teaching Format	The lecturer will be present in the laboratory, assisting and supervising the development of the activities. The laboratory activities aim at applying specific professional knowledge acquired during the lecturing activities of the course "42635 Cantiere 4.0".
Mandatory Attendance	Strongly recommended.
Specific Educational Objectives and Learning Outcomes	The course aims at providing an adequate mastery of the specific professional methods and knowledge of process management along the value chain of the timber industry, with reference to the pre-production (design and engineering) and post-production (on-site assembly, facility management and disassembly) phases. Expected learning outcomes (ILO) Knowledge and understanding: 1. Knowledge and understanding of the fundamental methodologies for process management in the timber industry, also making use of digital tools and techniques. Ability to apply the knowledge learned: 2. Ability to transfer process management methodologies into professional activities to ensure greater efficiency and

	effectiveness, along the entire value chain of a product in the timber industry. Making judgements: 3. Ability to implement innovative technologies in a sustainable way according to business needs through listening and problem-solving skills. Communication skills: 4. Ability to present and analyse problems, offering solutions in a clear and exhaustive manner even during group work or in collaboration with other specialists in the field. Learning skills: 5. Ability to face continuous training on specific technologies for process management in the timber industry, implementing emerging technologies and innovative methodologies.
Specific Educational Objectives and Learning Outcomes (additional info.)	
Assessment	Non-attending students must develop autonomously the laboratory activities, attending a final presentation of the outcomes with the lecturer during the office hours. Summative assessment: 100% evaluation of lab activities; ILOs assessed: 1,2,3,4,5.
Evaluation Criteria	The laboratory activities are assessed only through a "passed/not passed" criteria. Criteria for the evaluation of the outcomes from laboratory activities both for attending and non-attending students: • Correctness in the execution of the various phases of the activities and consistency with the contents of the course "42635 Cantiere 4.0".
Required Readings	• Cristina Benedetti, Vincenzo Bacigalupi; Legno architettura: il futuro della tradizione, ISBN: 88-7890-039-7 • Maurizio Piazza, Roberto Tomasi, Roberto Modena; Strutture in legno: materiale, calcolo e progetto secondo le nuove normative europee, ISBN: 978-88-203-3583-0 • Klaus Erlach; Value Stream Design, ISBN 978-3-642-12568-3 • Rafael Sacks, Chuck Eastman, Ghang Lee, Paul Teicholz; BIM Handbook: A Guide to Building Information Modeling for Owners, Designers, Engineers, Contractors, and Facility Managers, ISBN: 978-1-119-28753-7

	• Arturo Tedeschi; Architettura Parametrica, ISBN: 978-88-95315-08-9 97 Subject Librarian: David Gebhardi, David.Gebhardi@unibz.it and Ilaria Miceli, Ilaria.Miceli@unibz.it
Supplementary Readings	• Cristina Benedetti [et al.]; Costruire in legno: edifici a basso consumo energetico, ISBN: 978-88-6046-019-6 • Umberto Barbisan, Franco Laner; Capriate e tetti in legno: progetto e recupero, ISBN: 88-464-2274-0 • Brad Hardin, Dave McCool; BIM and Construction Management: Proven Tools, Methods, and Workflows, ISBN: 978-1-118-94276-5 • Achim Menges, Sean Ahlquist; Computational Design Thinking: Computation Design Thinking, ISBN: 978-0-470-66570-1
Further Information	Software used: • Microsoft - PowerPoint • Robert McNeel & Associates - Rhinoceros v7 or earlier.
Sustainable Development Goals (SDGs)	Industry, innovation and infrastructure, Responsible consumption and production, Sustainable cities and communities