Syllabus

Course Description

Course Title	Construction Site 4.0
Course Code	42635
Course Title Additional	
Scientific-Disciplinary Sector	IIND-04/A
Language	Italian
Degree Course	Professional Bachelor in Wood Technology
Other Degree Courses (Loaned)	
Lecturers	Arch. Gabriele Pasetti Monizza, gabriele.pasettimonizza@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	30
Lab Hours	0
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 learn methods and strategies for the management

	and the control of horizontal and vertical digital processes along the value chain of the timber construction industry, in detail: • Timber constructions technologies - assembly and connection systems, prefabrication, transport and handling on site. • Industry 4.0 vs Construction 4.0 - the revolution of the intelligent connection of systems in constructions. • Horizontal process digitization and information management in construction - BIM. • Digital automation before production - Computational Design and Digital Fabrication. • Mapping and optimization of processes through Value Stream Mapping techniques and Lean Construction principles. • Management, optimization of resources and digital quality control - application of innovative technologies (Cloud, Augmented Reality and Virtual Reality) for checking installations and Facility Management of timber buildings.
Keywords	Timber technologies, Prefabrication, Digital technologies applied to constructions, Process optimization.
Recommended Prerequisites	None.
Propaedeutic Courses	
Teaching Format	The course is structured through frontal lessons for learning basic methods and concepts, together with exercise activities aiming at applying specific professional knowledge. Topics will be presented through presentations, using a blackboard when necessary. Exercise activities will apply CAD tools, visual scripting development software and vectorial drawing tools for diagram presentation.
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	The exam is an oral exam (30 min/candidate) with specific questions to test knowledge application skills, evaluating the learning outcomes. Non-attending students must acquire autonomously the requested skills through the shared documents within the course page and through the required readings. Summative assessment: Oral exam: 100%; length/duration: 30 minutes; ILOs assessed: 1,2,3,4,5.
Evaluation Criteria	The final mark is an evaluation of the final oral exam. Criteria for the evaluation of the final oral exam both for attending and non-attending students: • Knowledge and correctness exposing the lecture contents, argumentative clarity, ability of critical analysis, ability of re-elaboration.

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/or 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 o precedenti
Sustainable Development Goals (SDGs)	Industry, innovation and infrastructure, Responsible consumption and production, Sustainable cities and communities