

COURSE DESCRIPTION – ACADEMIC YEAR 2024/2025

Course title	Cantiere 4.0
Course code	42635
Scientific sector	ING-IND/16
Degree	Professional Bachelor in Wood Technology (L-P03)
Semester	1
Year	2
Credits	3
Modular	No
Total lecturing hours	30
Total lab hours	-
Attendance	Strongly recommended
Prerequisites	-
Course page	Microsoft Teams and https://ole.unibz.it/
Specific educational objectives	<p>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.</p> <p>The course aims at providing an adequate mastery of methods and specific professional knowledges about the management of digital processes along the value chain of the timber industry, with specific reference to the phases before production (design and engineering) and after production (assembly on site, facility management and disassembling).</p> <p>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 industry.</p>
Lecturer	Gabriele Pasetti Monizza
Contact	gabriele.pasettimonizza@unibz.it
Scientific sector of lecturer	ING-IND/16, ICAR/12
Teaching language	Italian
Office hours	Wednesday 17:30- 19:30, scheduled beforehand by email.
Lecturing Assistant (if any)	-
Contact LA	-
Office hours LA	-
List of topics	<p>The course will cover the following specific topics:</p> <ul style="list-style-type: none"> • 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.

	<ul style="list-style-type: none"> • 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.
<p>Teaching format</p>	<p>The course is structured through frontal lessons for learning basic methods and concepts, together with specific exercise activities aiming at applying specific professional knowledge.</p> <p>Topics will be presented through presentations, using a blackboard when necessary.</p>
<p>Learning outcomes</p>	<p>Knowledge and understanding:</p> <ul style="list-style-type: none"> • Knowledge and understanding of the fundamental methodologies for the management of digital processes in the timber industry. <p>Applying knowledge and understanding:</p> <ul style="list-style-type: none"> • Ability to transfer into professional activities the methodologies for the management of digital processes in order to ensure higher efficiency and effectiveness of the systems along the entire value chain system of a product in the timber industry. <p>Making judgments</p> <ul style="list-style-type: none"> • Ability to implement innovative technologies in a sustainable way according to business needs through listening and problem-solving skills. <p>Communication skills</p> <ul style="list-style-type: none"> • Ability to present and analyse problems, offering solutions in a clear and comprehensive way even during teamwork. <p>Learning skills</p> <ul style="list-style-type: none"> • Ability to face a continuous training on specific technologies for the management of digital processes in the timber industry, being able to implement new emerging and innovative technologies.
<p>Assessment</p>	<p>The exam is an oral exam (30 min/candidate) with specific questions to test knowledge application skills, evaluating the learning outcomes.</p> <p>Non-attending students must acquire autonomously the requested skills through the shared documents within the course page and through the required readings.</p>
<p>Assessment language</p>	<p>Italian</p>
<p>Assessment Typology</p>	<p>Monocratic</p>

<p>Evaluation criteria and criteria for awarding marks</p>	<p>The final mark is an evaluation of the final oral exam.</p> <p>Criteria for the evaluation of the final oral exam both for attending and non-attending students:</p> <ul style="list-style-type: none"> • Knowledge and correctness exposing the lecture contents, argumentative clarity, ability of critical analysis, ability of re-elaboration.
<p>Required readings</p>	<ul style="list-style-type: none"> • Cristina Benedetti, Vincenzo Bacigalupi; <i>Legno architettura: il futuro della tradizione</i>, ISBN: 88-7890-039-7 • Maurizio Piazza, Roberto Tomasi, Roberto Modena; <i>Strutture in legno: materiale, calcolo e progetto secondo le nuove normative europee</i>, ISBN: 978-88-203-3583-0 • Klaus Erlach; <i>Value Stream Design</i>, ISBN 978-3-642-12568-3 • Rafael Sacks, Chuck Eastman, Ghang Lee, Paul • Teicholz; <i>BIM Handbook: A Guide to Building Information Modeling for Owners, Designers, Engineers, Contractors, and Facility Managers</i>, ISBN: 978-1-119-28753-7 • Arturo Tedeschi; <i>Architettura Parametrica</i>, ISBN: 978-88-95315-08-9 97 <p>Subject Librarian: David Gebhardi, David.Gebhardi@unibz.it and Ilaria Miceli, Ilaria.Miceli@unibz.it</p>
<p>Supplementary readings</p>	<ul style="list-style-type: none"> • Cristina Benedetti [et al.]; <i>Costruire in legno: edifici a basso consumo energetico</i>, ISBN : 978-88-6046-019-6 • Umberto Barbisan, Franco Laner; <i>Capriate e tetti in legno : progetto e recupero</i>, ISBN : 88-464-2274-0 • Brad Hardin, Dave McCool; <i>BIM and Construction Management: Proven Tools, Methods, and Workflows</i>, ISBN: 978-1-118-94276-5 • Achim Menges, Sean Ahlquist; <i>Computational Design Thinking: Computation Design Thinking</i>, ISBN: 978-0-470-66570-1
<p>Software used</p>	<ul style="list-style-type: none"> • Microsoft - PowerPoint • Robert McNeel & Associates - Rhinoceros v7 or earlier