COURSE DESCRIPTION – ACADEMIC YEAR 2025/2026

Course title	**Laboratory of Mechatronics and Process Automation**
Course code	42629
Scientific sector	IIND-02/A
Degree	Professional Bachelor in Wood Technology (L-P03)
Semester	1
Year	3
Credits	3
Modular	No

Total lecturing hours	30
Total lab hours	
Attendance	Strongly recommended
Prerequisites	Students should be familiar with the basic knowledge of physics and mathematical analysis and programming.
Course page	Microsoft Teams

Specific educational objectives	The laboratory course provides students with hands-on experience in modeling and analyzing mechanical systems through virtual prototyping. The course introduces the fundamentals of multibody simulation, focusing on the kinematic modeling of open and closed chains, the definition of constraints, and the integration of actuators. Students learn to conduct kinematic and dynamic analyses and interpret simulation results. Moreover, students learn to apply knowledge on selecting and sizing geared motors. An introduction to sensors and perception for automation and robotics applications is provided. By the end of the course, participants acquire the skills to design, simulate, and evaluate mechanical systems related to wood engineering.

Lecturer	Diego Tiozzo Fasiolo
Contact	diego.tiozzo@uniud.it
Scientific sector of lecturer	IIND-02/A
Teaching language	English
Office hours	See timetable online: www.unibz.it/en/timetable/ and by appointment
Lecturing Assistant	
Contact LA	
Office hours LA	
List of topics	• Fundamentals of multibody system dynamics • Simulation of virtual prototypes • Kinematic and dynamic analyses tools • Motor-gearbox combination selection • Sensors and perception for mechatronics
Teaching format	Frontal lectures, exercises

Learning outcomes	Knowledge and understanding: • Know and understand how to model and simulate mechanical/mechatronic systems • Know and understand how to size and select a motor

	gearbox combination that meet the application needs • Know and understand the basics of sensors and perception for mechatronics applications Applying knowledge and understanding: • Apply knowledge and understanding to model real mechanical systems, also related to wood engineering • Interpreting simulation results Making judgments • Choose suitable and proper simulation setup • Transfer the knowledge and methods to real-world practical applications Communication skills • Discuss technical documentation and case studies as well as communicate with technical language Learning skills • Ability to independently extend the knowledge acquired during the study course by reading and understanding technical documentation

Assessment	Formative Assessment The exercises in the classroom as well as discussions with the professor during the lectures enables to assess and evaluate the student's ability to apply their knowledge and understanding of the topics covered during the course. Summative Assessment The final exam consists of a self-paced exercise in which students will model and simulate a real-world mechanical system. The simulation results must be presented with a 10 minutes talk supported by slides.
Assessment language	English
Assessment Typology	
Evaluation criteria and criteria for awarding marks	Pass/Fail

Required readings	The course material is collected from various textbooks, lecture notes, research papers, and software websites. The student can mainly refer to the lecture slides and readings provided by the professors.
Supplementary readings	
Software used	MSC Adams, Open-Source robotics softwares