

Syllabus

Descrizione corso

Titolo insegnamento	Laboratorio di Meccatronica e Automazione di Processo
Codice insegnamento	42629
Titolo aggiuntivo	
Settore Scientifico-Disciplinare	NN
Lingua	Inglese
Corso di Studio	Corso di laurea professionalizzante in Tecnologie del Legno
Altri Corsi di Studio (mutuati)	
Docenti	dr. Diego Tiozzo Fasiolo, Diego.TiozzoFasiolo@unibz.it https://www.unibz.it/en/faculties/engineering/academic-staff/person/52711
Assistente	
Semestre	Primo semestre
Anno/i di corso	3
CFU	3
Ore didattica frontale	30
Ore di laboratorio	0
Ore di studio individuale	45
Ore di ricevimento previste	
Sintesi contenuti	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. • Fundamentals of multibody system dynamics • Simulation of virtual prototypes • Kinematic and dynamic analyses tools • Motor-gearbox combination selection • Sensors and perception for mechatronics.
Argomenti	

dell'insegnamento	
Parole chiave	
Prerequisiti	Students should be familiar with the basic knowledge of physics and mathematical analysis and programming.
Insegnamenti propedeutici	
Modalità di insegnamento	Frontal lectures, exercises.
Obbligo di frequenza	Strongly recommended.
Obiettivi formativi specifici e risultati di apprendimento attesi	The laboratory course provides students with hands-on experience in modeling and analyzing mechanical systems through virtual prototyping. 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. 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.
Obiettivi formativi specifici e risultati di apprendimento attesi (ulteriori info.)	
Modalità di esame	- 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.
Criteri di valutazione	Pass/Fail.
Bibliografia obbligatoria	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.
Bibliografia facoltativa	
Altre informazioni	Software used: MSC Adams, Open-Source robotics softwares.
Obiettivi di Sviluppo Sostenibile (SDGs)	