Syllabus

Kursbeschreibung

Titel der Lehrveranstaltung	Labor für Mechatronik und Automatisierungstechnik
Code der Lehrveranstaltung	42629
Zusätzlicher Titel der Lehrveranstaltung	
Wissenschaftlich-disziplinärer Bereich	NN
Sprache	Englisch
Studiengang	Berufsbildender Bachelor in Holztechnik
Andere Studiengänge (gem. Lehrveranstaltung)	
Dozenten/Dozentinnen	Dr. Diego Tiozzo Fasiolo, Diego.TiozzoFasiolo@unibz.it https://www.unibz.it/en/faculties/engineering/academic-staff/person/52711
Wissensch. Mitarbeiter/Mitarbeiterin	
Semester	Erstes Semester
Studienjahr/e	3
KP	3
Vorlesungsstunden	30
Laboratoriumsstunden	0
Stunden für individuelles Studium	45
Vorgesehene Sprechzeiten	
Inhaltsangabe	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.
Themen der Lehrveranstaltung	
Stichwörter	
Empfohlene Voraussetzungen	Students should be familiar with the basic knowledge of physics and mathematical analysis and programming.
Propädeutische Lehrveranstaltungen	
Unterrichtsform	Frontal lectures, exercises.
Anwesenheitspflicht	Strongly recommended.
Spezifische Bildungsziele und erwartete Lernergebnisse	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.
Spezifisches Bildungsziel und erwartete Lernergebnisse (zusätzliche Informationen)	
Art der Prüfung	- 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.
Bewertungskriterien	Pass/Fail.
Pflichtliteratur	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.
Weiterführende Literatur	
Weitere Informationen	Software used: MSC Adams, Open-Source robotics softwares.
Ziele für nachhaltige Entwicklung (SDGs)	