

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	Dott. Chiara Nezzi, Chiara.Nezzi@unibz.it https://www.unibz.it/en/faculties/engineering/academic-staff/person/37957
Wissensch. Mitarbeiter/Mitarbeiterin	
Semester	Erstes Semester
Studienjahr/e	3
KP	3
Vorlesungsstunden	30
Laboratoriumsstunden	0
Stunden für individuelles Studium	45
Vorgesehene Sprechzeiten	9
Inhaltsangabe	The course provides the students with a general overview of real-world applications, applied examples and lab exercises related to automation and mechatronics, with a peculiar focus on the wood sector. - Automated solutions for wood sector - Simulation for mechatronics: examples and exercises - Motor-transmission sizing

	- Introduction to robotics - Lab exercise
Themen der Lehrveranstaltung	The course introduces the fundamentals of multibody simulation, focusing on the kinematic modelling of open and closed chains, the definition of constraints, and the integration of actuators. Simulation of virtual prototypes, motor-gearbox combination selection and practical examples will be studied and developed during in-class exercises. The course concludes with a brief introduction to robotics and related laboratory hands-on sessions.
Stichwörter	Multibody Simulation Mechatronics Robotics
Empfohlene Voraussetzungen	Students should be familiar with the basic knowledge of physics, 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 modelling and analysing mechatronic systems through simulation. 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 for automation and robotics applications is provided. By the end of the course, participants acquire the skills to design, simulate, finally analyse and interpret mechatronic systems' behaviour. This is achieved through practical examples and lab exercises, with a focus on wood engineering. Knowledge and understanding: • Know and understand how to model and simulate 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 robotics for mechatronics applications Applying knowledge and understanding:

	• Apply knowledge and understanding to model real mechatronic 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 an applied exercise in which students will deal with a real-world mechatronic system and will need to pursue a given task, based of the knowledge acquired during the course. The results must be presented with a 10 minutes talk supported by slides.
Bewertungskriterien	Pass/Fail.
Pfichtliteratur	• Notes taken during lecture • Lecture slides
Weiterführende Literatur	Kaltjob, Patrick OJ. <i>Mechatronic systems and process automation: Model-driven approach and practical design guidelines</i> . CRC Press, 2018.
Weitere Informationen	

Ziele für nachhaltige Entwicklung (SDGs)	Industrie, Innovation und Infrastruktur, Nachhaltiger Konsum und Produktion, Nachhaltige Städte und Gemeinden
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