

Syllabus

Course Description

Course Title	Mechatronics and Process Automation
Course Code	42628
Course Title Additional	
Scientific-Disciplinary Sector	IIND-02/A
Language	German
Degree Course	Professional Bachelor in Wood Technology
Other Degree Courses (Loaned)	
Lecturers	dr. Veit Gufler, Veit.Gufler@unibz.it https://www.unibz.it/en/faculties/engineering/academic-staff/person/38756
Teaching Assistant	
Semester	First semester
Course Year/s	3
CP	3
Teaching Hours	30
Lab Hours	0
Individual Study Hours	45
Planned Office Hours	9
Contents Summary	- Modeling and simulation - Electrical and hydraulic actuators - Power transmission - Machine dynamics and motor-load coupling - Data acquisition and sensing
Course Topics	The course provides fundamental knowledge of mechatronics and automation engineering. Topics include methods for the modeling and simulation of mechatronic systems, electrical and hydraulic actuators, as well as key drive components for the transmission and conversion of motion and forces. Further emphasis is placed

	on machine dynamics and the interactions between motors, transmissions, and loads. In addition, methods for data acquisition and sensor technology are introduced, with a focus on essential sensor parameters and their characteristics.
Keywords	mechatronics, drives, power transmission, sensing
Recommended Prerequisites	Students should be familiar with the basic knowledge of physics and mathematical analysis.
Propaedeutic Courses	
Teaching Format	Frontal lectures, exercises.
Mandatory Attendance	Strongly recommended.
Specific Educational Objectives and Learning Outcomes	Learning outcomes Knowledge and Understanding: - Fundamentals of mechatronics and process automation - Principles and applications of electrical and hydraulic actuators - Power transmission and coupling of motor, transmission and load - Fundamentals of data acquisition and sensing Applying Knowledge and Understanding: - Analysis and evaluation of mechatronic systems - Application of methods for the selection of suitable actuators, transmission systems and sensors Making Judgements: - Evaluation of mechatronic solutions with respect to functionality, performance and limitations - Selection of technical components based on specified requirements Communication Skills: - Analysis and discussion of technical documentation - Discussion of technical problems and solution concepts Learning Skills: - Independent deepening of course content through the use of scientific and technical literature - Familiarization with new components and technologies in the field
Specific Educational Objectives and Learning Outcomes (additional info.)	
Assessment	The assessment is based on a written examination consisting of numerical exercises accounting for 60 % of the final grade and theoretical questions accounting for 40 %.

Evaluation Criteria	The assessment criteria for the numerical exercises are the correctness of the solution procedure and the results. The assessment criteria for the theoretical questions are based on knowledge of the course topics, the clarity and relevance of the answers, command of the language of instruction, and the ability to exercise independent judgment. The weighting of each numerical exercise and theoretical question is specified in the written examination.
Required Readings	• Notes taken during lecture • Lecture slides
Supplementary Readings	• W. Roddeck. Einführung in die Mechatronik. Wiesbaden: Springer, 2023. https://doi.org/10.1007/978-3-658-41950-9
Further Information	
Sustainable Development Goals (SDGs)	Quality education, Industry, innovation and infrastructure, Affordable and clean energy