

Course: Robot Control - Mechatronics

credits: 15

Course code	ELVB23RCM	Modes of delivery	Assignment
Name	Robot Control - Mechatronics		Lecture
Study year	2023-2024		Practical / Training
ECTS credits	15	Assessments	Robot Control - Mechatronics - Assignment
Language	English		
Coordinator	F. Martins		

Learning outcomes

Design: The starting professional considers various solutions in order to arrive at a detailed and well-founded (electro)technical product/service/process based on the program of requirements, making use of appropriate design methods and taking social interests and engineering standards into account.

Realization: The starting professional realizes and validates a (prototype of a) product/service/process based on an (electrical) technical design and makes appropriate use of materials/techniques/instruments.

Management: The starting professional can professionally set-up, execute, plan, adjust and deliver a small-scale project on time.

Content

This course is focused on the simulation, assembly and control of robots to perform a predefined task.

Topics include: programming of a microcontroller board to implement the robot control, different sensors to measure internal and external variables (for example in robot localization, navigation and obstacle avoidance), mathematical modeling and simulation. Concepts of controllers (like PID) are reviewed and applied in the context of go-to-goal, path following, trajectory-tracking controllers for mobile robots. Different techniques to control mobile robots are discussed, like behavior-based robotics, behavior trees and/or finite state-machines.

Students will work in groups and may focus on specific topics depending on their major/specialization. They need to manage their own project work (for instance project plan/milestones/scrum, budget, role definition, presenting etc.), document their results (in English – B2 level) and demonstrate their working prototype.

Included in programme(s)

Electrical Engineering Major Mechatronics

School(s)

Institute of Engineering