Fakultät für Ingenieurwesen
Facoltà di Ingegneria
Faculty of Engineering

COURSE DESCRIPTION – ACADEMIC YEAR 2024/2025

Course title	**Introduction to robot control**
Course code	43079
Scientific sector	ING-INF/04
Degree	Bachelor in Industrial and Mechanical Engineering (L9)
Semester	1
Year	3
Credits	6
Modular	No

Total lecturing hours	36
Total lab hours	24
Attendance	Recommended
Prerequisites	Lectures and exercises of Mathematical Analysis I and II, Geometry, Physics I, Mechanics of Machinery
Course page	https://ole.unibz.it/

Specific educational objectives	The course belongs to the type "free choice course". It is designed for acquiring professional skills and knowledge.

Lecturer	Prof. Angelika Peer, https://www.unibz.it/it/faculties/engineering/academic-staff/person/38684-angelika-peer
Contact	NOI Techpark A1.4.29A, angelika.peer@unibz.it, phone: +39 0471 017 766
Scientific sector of lecturer	ING-INF/04 – AUTOMATION
Teaching language	English
Office hours	After consultation and agreement with lecturer
Lecturing Assistant (if any)	-
Contact LA	-
Office hours LA	-
List of topics	• Robot kinematics and dynamics • Trajectory planning • Motion control • Interaction control • Vision-based control • Remote control • Computer-aided simulation and design
Teaching format	The lessons are divided into frontal classroom lessons, and exercises to be solved alone or in a group with the help of Matlab/Simulink.

Learning outcomes	Knowledge and understanding Knowledge and understanding in the field of: 1. Theory of control of robot manipulators Applying knowledge and understanding

	2. Ability to apply knowledge for solving given problems, including solving them with numerical data and with the help of software packages like Matlab/Simulink. Making judgements 3. Ability to judge plausibility of results. Communication skills 4. Maturing of technical-scientific terminology. Ability to learn 5. Learning skills to independently study and apply methods of systems and control for specific applications beyond topics covered in this lecture.

Assessment	**Summative assessment** **Form** / **%** / **Length /duration** / **ILOs assessed** Oral / 100 / 30 minutes / 1-5
Assessment language	English
Assessment Typology	Monocratic (Collegiale se esame modulare)
Evaluation criteria and criteria for awarding marks	• clarity and correctness of answers; • soundness of the sketched approach to address a problem and the single steps involved; • ability to summarize, evaluate, and establish relationships between topics; • correct usage of terminology

Required readings	Blackboard and slides Subject Librarian: David Gebhardi, David.Gebhardi@unibz.it and Ilaria Miceli, Ilaria.Miceli@unibz.it
Supplementary readings	Introduction to Robotics – Mechanics and Control, John Craig, Pearson, 2018 Robotics – Modelling, Planning and Control, Bruno Siciliano, Lorenzo Sciavicco, Luigi Villani, Giuseppe Oriolo, Springer, 2009. Robot Modeling and Control, Mark W. Spong, Seth Hutchinson, M. Vidyasagar, Wiley, 2006. Modern Robotics – Mechanics, Planning and Control, Kevin M. Lynch, Frank C. Park, Cambridge, 2018. Modelling, Indentification & Control of Robots, W. Khalil & E. Dombre, Kogan Page Science, 2004

	Robotics, Vision and Control, Peter Corke, Springer, 2011
Software used	Matlab/Simulink