

Syllabus

Descrizione corso

Titolo insegnamento	Controllo di Robot
Codice insegnamento	42417
Titolo aggiuntivo	
Settore Scientifico-Disciplinare	IINF-04/A
Lingua	Tedesco
Corso di Studio	Corso di laurea in Ingegneria Elettronica e dei Sistemi ciberfisici
Altri Corsi di Studio (mutuati)	
Docenti	prof. dr. Angelika Peer, Angelika.Peer@unibz.it https://www.unibz.it/en/faculties/engineering/academic-staff/person/38684
Assistente	
Semestre	Secondo semestre
Anno/i di corso	3
CFU	6
Ore didattica frontale	36
Ore di laboratorio	24
Ore di studio individuale	90
Ore di ricevimento previste	18
Sintesi contenuti	1. Robot kinematics and dynamics 2. Trajectory planning 3. Motion control 4. Interaction control 5. Vision-based control 6. Remote control 7. Computer-aided simulation and design
Argomenti dell'insegnamento	The lecture introduces to topics of robot modelling in terms of kinematics and dynamics, trajectory planning and the control of

	robot manipulators with focus on motion control in joint and task space, interaction control, and vision-based control. Matlab/Simulink is introduced as computer-aided simulation and design tool to support the controller analysis and design.
Parole chiave	Robot kinematics and dynamics; Trajectory planning; Motion control; Interaction control; Vision-based control; Computer-aided simulation and design
Prerequisiti	
Insegnamenti propedeutici	
Modalità di insegnamento	The lessons are divided into frontal classroom lessons, and exercises to be solved alone or in a group with the help of Matlab/Simulink.
Obbligo di frequenza	recommended
Obiettivi formativi specifici e risultati di apprendimento attesi	Knowledge and understanding 1. Knowledge and understanding in the field 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 robot control for specific applications beyond topics covered in this lecture.
Obiettivi formativi specifici e risultati di apprendimento attesi (ulteriori info.)	
Modalità di esame	Formative assessment: In-class exercises (continuously as part of course accompanying exercises) Summative assessment: oral exam of approx. 30 minutes
Criteri di valutazione	• 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
Bibliografia obbligatoria	Blackboard and slides
Bibliografia facoltativa	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, Identification & Control of Robots, W. Khalil & E. Dombre, Kogan Page Science, 2004. Robotics, Vision and Control, Peter Corke, Springer, 2011.
Altre informazioni	Software used: Matlab/Simulink
Obiettivi di Sviluppo Sostenibile (SDGs)	Istruzione di qualità