



UNIVERSITY OF NIŠ

Course Unit Descriptor

Faculty

Faculty of Mechanical Engineering

GENERAL INFORMATION

Study Program	Mechatronics and Control		
Study Module (if applicable)	-		
Course Title	Robotics		
Level of Study	<input type="checkbox"/> Bachelor	<input checked="" type="checkbox"/> Master's	<input type="checkbox"/> Doctoral
Type of Course	<input checked="" type="checkbox"/> Obligatory	<input type="checkbox"/> Elective	
Semester	<input checked="" type="checkbox"/> Autumn	<input type="checkbox"/> Spring	
Year of Study	I		
Number of ECTS Allocated	7		
Name of Lecturer/Lecturers	Žarko Čojbašić		
Teaching Mode	<input checked="" type="checkbox"/> Lectures	<input type="checkbox"/> Group tutorials	<input type="checkbox"/> Individual tutorials
	<input checked="" type="checkbox"/> Laboratory work	<input checked="" type="checkbox"/> Project work	<input checked="" type="checkbox"/> Seminar
	<input type="checkbox"/> Distance learning	<input type="checkbox"/> Blended learning	<input type="checkbox"/> Other

Purpose and Overview (max. 5 sentences)

Introduce students to the theoretical basics of robotics, robot types, principles of contemporary industrial robotics, basics of kinematics, dynamics and control of industrial robots, as well as basic components and applications of robotic systems. To provide that systems are capable to design, select control and apply robotic systems and especially industrial robots, as well as to use different models and to be prepared for further education in the field of robotics.

Syllabus (brief outline and summary of topics, max. 10 sentences)

Theoretical lectures * Basic robot types. Industrial and service robotics. * Kinematics. Link between end effector coordinates and joint positions. Direct and inverse kinematics. Task of moving end effector along desired trajectory. * Robot dynamics, dynamic models. Selection of robot parameters. Test of dynamic characteristics. * Control of one robot joint, servosystem synthesis. Effect of moments of inertia. Effect of gravitational moments and friction. * Synthesis of servosystem for trajectory tracking. Control of simultaneous movement of several joints. * Dynamic robot control. Robot dynamics in contact tasks. * Sensors and actuators in robotics and especially in industrial robotics. Applications of industrial robots.

Practical work * Computational exercises. Individual work – forming of models of robot with 3 DOF for existing configurations of industrial robots. Laboratory programming of industrial robots.

Language of Instruction

- Serbian (complete course) English (complete course) Other _____ (complete course)
- Serbian with English mentoring Serbian with other mentoring _____

Assessment Methods and Criteria

Pre exam Duties	Points	Final Exam	Points
Activity During Lectures	10	Written Examination	25
Practical Teaching	40	Oral Examination	25
Teaching Colloquia	0	Overall Sum	100

***Final examination mark is formed in accordance with the Institutional documents**