Study program / course: Mechanical Engineering

Type and level of study: Master academic studies

Course: Robotics and mechatronics

Lecturers: Ilija Nikolić

Status of course: Elective, joint for modules M_5 and M_7, III semester

Number of ECTS: 6

Prerequisite: None

The objective of course

Students should know how to select a type of robot depending on the working task, then to know how to design the robots' working tasks and fundamentals of the robot control and programming. They should be acquainted with the programs and tools in robotics. They should possess the basic knowledge of mechatronics in general and mechatronics of robots especially.

The outcome of course

Students are capable to select the adequate type of robot for each working task, they know how to design the working task and they know all the additional components of robots (tools and grippers). They are also capable of reprogramming the robot for another working task with awareness of the control restraints.

Syllabus

Theoretical study

Introduction to robotics - types and groups of robots. Robots' kinematics. Trajectories and their calculations. Robots' dynamics and its determination. Control of robots, types of control, sensors and actuators. Robots' programming. Training of robots for various working tasks. Fundamentals of the robots' mechatronics. Cooperative robots (cobots) and moving robots.

Practical Studies:

Problems solving, laboratory work, homeworks, tests and colloquia. (Same areas as for theoretical lecturing).

Recommended reading

1. Nikolić, I., V. Čović,"Selected Chapters in Robots Mechanics", Faculty of Mechanical Engineering, Belgrade, 1999. (In Serbian).
2. Nikolić, I. "Robotics and Mechatronics", (Lecture notes in E-form), Faculty of Mechanical Engineering, Kragujevac, 2007.

The number of hours of active teaching:				Other classes:
Theory: 3	Practical classes: 1.4	Other forms of teaching: Consultations 0.6	Research study:	Final test 1

Methods of teaching

Lecturing, Practical work, consultations (group and individual)

Evaluation of knowledge

Pre-final exam obligations	Points	Final exam	Points
Activities during the classes:	**10**	Final test*	**30**
Colloquia:	**40**		
Seminar paper:	**20**		

***** The final test is taken only by candidates that are not satisfied with their score on pre-final exam obligations.