

MM3351

Study program / course: Mechanical Engineering				
Type and level of study: Master academic studies				
Course: Design of automatic control systems				
Lecturers: Milan S. Matijevic, Vesna M. Rankovic, Petar M. Todorovic				
Status of course: Elective for modules M5 and M7, III semester				
Number of ECTS: 6				
Prerequisite: none				
The course objective: Students will follow all phases of design on automatic control system: design of technical conditions, functional and structural definition of the system, identification and analysis of controlled object, selection and/or design of important components of the system (sensors, actuators and regulators), synthesis, implementation and techno-economic analysis of system.				
The course outcome: Knowledge and skills in the context of design of one typical automatic control system. The goal is training students for individual or team based design of automatic control system.				
Syllabus: <i>Theory</i> 1. Introduction. 2. Structure and models of automatic control systems. 3. Technical characteristics. 4. Communication. 5. Identification of object and control systems. 6. Selection of measurement converters. 7. Selection of drives. 8. Selection of actuators and servo motors. 9. Conditioning and filtration of signals. 10. Control algorithms. 12. Design of complex systems. 13. Design systems for practical implementation. 14. Design of sequential control systems. SCADA and DCS systems. 15. Technical aspects of design automatic control systems. <i>Practice:</i> Practical classes, other classes Listed issues will be presented during laboratory exercises working in class with laboratory equipment (implementation of sensors and actuators) and computers (modeling and simulation).Students will be able to perform researches in the field of the course.				
Recommended reading: 1. Ljubisa S. Draganovic, Design of automatic control systems, Lola Institute, Belgarde, 1999. 2. Ljubisa S. Draganovic, Elements and systems of automatic control – design principles, Lola Institute, Belgrade 1997. 3. Matijevic M., Jakupovic G. Car J. “Computer supported measurement and control” Faculty of Mechanical Engineering, Kragujevac, 2005.				
The number of hours of active teaching:				Other classes: 1
Theory: 3	Practical classes: 1,4	Other forms of teaching: 0,6	Research study: 0	
Methods of teaching Teaching with ex cathedra approach with multimedia presentations and interactive work with students. Auditoria exercises combine ex cathedra approach and computer tools. Laboratory exercises refer to filed of implementation of sensors and actuators.				
Evaluation of knowledge (maximal 100 points)				
Pre-final exam obligations	Points	Final exam	Points	
Activities during the classes	5	Written		
Activities during the exercises		Oral presentation	50	
Tests:				
Seminars:	45			