AUTOMATED CONTROL SYSTEMS

COURSE SYLLABUS

COURSE DETAILS

Type of study programme	Professional study - 180 ECTS	
Study programme	POWER ENGINEERING	
Course title	Automated Control Systems	
Course code	SEN019	
ECTS (Number of credits allocated)	5	
Course status	Core	
Year of study	Second	
Semester	Third (fall)	
Course Web site	http://www.oss.unist.hr/	
Total lesson hours per semester	Lectures	30
	Practices	15
	Laboratory exercises & practical demonstration	15
Prerequisite(s)	None	
Lecturer(s)	Department of Electrical Engineering faculty: Predrag Đukić, Ph.D., College professor	
Language of instruction	Croatian, English	

COURSE DESCRIPTION	
Course Objectives:	• understanding basic laws and phenomena in the area of Control systems theory and practice, • theoretical and practical preparation of students to acquire and apply knowledge and skills in professional and specialist courses (mechatronics, hydraulics and pneumatics), • conducting experiments in laboratory and industrial environment.
Learning outcomes *On successful completion of this course, student should be able to:*	1. explain fundamental physical and technical base of Control systems, 2. describe basic laws and phenomena that define behaviour of automated control systems, 3. analyse various premises, approaches, procedures and results related to automated control, 4. create analytical, design and development solutions for components, devices and equipment of automated control systems, 5. conduct experiments and measurements in laboratory and on real components, devices and equipment of automated control systems, 6. interpret the acquired data and measured results, 7. describe development and application of automated control systems, 8. take part in team work and be able to independently present various professional materials.
Course content	Introduction to dynamic systems. Description of dynamic systems using math equations (Laplas transform), solving and prediction of dynamic system behaviour. Stability criteria, steady state and transient errors. Errors as consequence of system parameters. Compensation and stabilisation of open and closed loop feedback systems. Use of commercial program packages in automated control systems (Matlab and Simulink)

CONSTRUCTIVE ALIGNMENT – Learning outcomes, teaching and assessment methods

Alignment of students activities with learning outcomes		
Activity	**Student workload ECTS credits**	**Learning outcomes**
Lectures	**30 hours/ 1 ECTS**	**1,2,3,4,5,6,7,8**
Practicals	**15 hours/ 0.5 ECTS**	**4,5,6,8**
Laboratory work	**15 hours/ 0.5 ECTS**	**4,5,6,8**
Preparation, laboratory mid-term exam	**30 hours/ 1 ECTS**	**4,5,6,8**
Self-study	**45 hours/ 1.5 ECTS**	**1,2,3,4,5,6,7,8**
Office hours and final exam	**15 hours/ 0.5 ECTS**	**1,2,3,4,5,6,7,8**
TOTAL:	**150 hours / 5 ECTS**	**1,2,3,4,5,6,7,8**

CONTINUOUS ASSESSMENT		
Continuous testing indicators	**Performance A_i (%)**	**Grade ratio k_i (%)**
Class attendance and participation	**70 - 100**	**0,1**
Laboratory work	**100**	**0,25**
Laboratory mid-term exam	**50-100**	**0,25**
First mid-term exam	**50-100**	**0,15**
Second mid-term exam	**50-100**	**0,15**
Third mid-term exam	**50-100**	**0,15**

FINAL ASSESSMENT		
Testing indicators – final exam (first and second exam term)	**Performance** A_i **(%)**	**Grade ratio** k_i **(%)**
Practical exam (written)	**50 - 100**	**40**
Theoretical exam (written and/or oral)	**50 - 100**	**50**
Previous activities (include all continuous testing indicators)	**50 - 100**	**10**
Testing indicators – makeup exam (third and fourth exam term)	**Performance** A_i **(%)**	**Grade ratio** k_i **(%)**
Practical exam (written)	**50 - 100**	**50**
Theoretical exam (written and/or oral)	**50 - 100**	**50**

PERFORMANCE AND GRADE		
Percentage	**Criteria**	**Grade**
50% - 61%	*basic criteria met*	**sufficient (2)**
62% - 74%	*average performance with some errors*	**good (3)**
75% - 87%	*above average performance with minor errors*	**very good (4)**
88% - 100%	*outstanding performance*	**outstanding (5)**

ADDITIONAL INFORMATION

Teaching materials for students (scripts, exercise collections, examples of solved exercises), teaching record, detailed course syllabus, application of e-learning, current information and all other data are available by MOODLE system to all students. http://moodle.oss.unist.hr/