

NAME OF THE COURSE		Computers in technical systems					
Code	PMT070	Year of study		3			
Course teacher	Siniša Antonijević	Credits (ECTS)		5,0			
Associate teachers	Hrvoje Turić	Type of instruction (number of hours)		L	S	E	F
				30		30	
Status of the course	mandatory	Percentage of application of e-learning		60			
COURSE DESCRIPTION							
Course objectives	Acquiring basic knowledge on application of computers in technical systems.						
Course enrolment requirements and entry competences required for the course	Course enrolment requirements: none Entry competences: basic knowledge of electrical engineering and electronics						
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: 1. Explain basic elements of control system 2. Describe general properties of sensors 3. Explain the application and principle of operation of various sensor types 4. Describe the purpose and application of various actuators 5. Explain the problem of signal noise and application of basic filters 6. Explain basic principles of analog-to-digital and digital-to-analog conversion 7. Analyse basic examples of analog-to-digital and digital-to-analog convertors 8. Explain the application and typical properties of programmable logic controller 9. Explain the application and typical properties of microcontroller						
Course content broken down in detail by weekly class schedule (syllabus)	1. Introduction to the course. Presentation of necessary requirements, grading criteria, and exam format. Overview of control system elements in general. 2. General properties of sensors. Position sensors. 3. Position sensors. 4. Force sensors. Light and temperature sensors. 5. Colloquium 1. Actuators. 6. Actuators. Analog signal processing in general. 7. Noise. Signal to noise ratio (SNR). Operational amplifiers. 8. Filters. 9. Analog-to-digital conversion 10. Analog-to-digital conversion. Digital-to-analog conversion. 11. Colloquium 2. Computers in control systems in general. Computer network topologies. 12. Digital communication. Basic elements of computer – central processing unit, memory, bus, input-output system. 13. Programmable logic controller (PLC) 14. Microcontroller 15. Colloquium 3.						
Format of instruction	<input checked="" type="checkbox"/> lectures <input type="checkbox"/> seminars and workshops <input type="checkbox"/> exercises <input type="checkbox"/> <i>on line</i> in entirety <input type="checkbox"/> partial e-learning <input type="checkbox"/> field work			<input type="checkbox"/> independent assignments <input type="checkbox"/> multimedia <input checked="" type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)			
Student responsibilities	Minimum 70% class attendance. All seminars must be successfully completed.						
Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	1	Research		Practical training		
	Experimental work	1	Report		(Other)		
	Essay		Seminar essay	1	(Other)		
	Tests		Oral exam	3	(Other)		
	Written exam		Project		(Other)		
Grading and evaluating student work in class and at the final exam	Student will have successfully completed the course if he/she a) achieves minimum 50% result at written exam, or b) achieves minimum 50% result at each optional colloquium In case only 1 of 3 optional colloquiums is not positive (less than 50% result), student will have an option for exam questions to be limited to chapters pertaining to this colloquium only. The student class activity is rewarded with "+". Each "+" will be cumulatively added as +1% on each subsequent colloquium result. The grade by percentages: 50% to 62% - 2 63% to 75% - 3 76% to 87% - 4 88% to						

	100% - 5		
Required literature (available in the library and via other media)	Title	Number of copies in the library	Availability via other media
	Lecture notes		Online
	V. Papić, "Računala u tehničkim sustavima"		Online
Optional literature (at the time of submission of study programme proposal)	- J.Park, S.Mackay, Practical Data Acquisition for Instrumentation and Control Systems, Newnes, 2003. - G. Smiljanić, Računala i procesi, Školska knjiga, Zagreb, 1991. - R. Bateson, Introduction to Control System Technology, Prentice Hall, 2002.		
Quality assurance methods that ensure the acquisition of exit competences	- communication with students - anonymous questionnaire - percentage of students that successfully complete course - self-analysis		
Other (as the proposer wishes to add)			