

Study program:	Electrical and Computer Engineering – Module: Computer Engineering, Mechatronics			
Type and level of studies:	Undergraduate academic studies (first level of studies)			
Course unit:	Computer controlled systems			
Teacher in charge:	Uros Pešović, teaching assistant Djordje Damnjanović			
Language of instruction:	English			
ECTS:	6			
Prerequisites:	-			
Semester:	Summer			
Course unit objective				
The objective of this course is to provide students with basic knowledge in the field of control systems, which in modern management systems are based on the application of computers and computer components. Modern management applications are based on digital information and involve the processing of various input / output data, processing and generation of a control action. The control system is a whole consisting of sensors and transducers, amplifiers and signal conditioners, portable media, central processor, computers and output devices. This course draws on knowledge of signal processing, systems and control theory, measuring converters. The planned goals are:				
1. Acquisition of new theoretical knowledge in the field of control systems, component control systems, input-output devices, measuring transducers, software packages for processing and control generation				
2. Familiarity with the characteristics of different industrial processes, different methods of process control and control				
3. Acquiring basic skills in the use of various implementation equipment in management systems				
Learning outcomes of Course unit				
After completing the course, it is expected that each student should be able to:				
1. Analyzes the system under management				
2. To recognize system components				
3. To recognize the management method				
4. To be able to independently design a simple, realistic control computer system				
Course unit contents				
<i>Theoretical classes</i>				
A/D conversion. D/A conversion. The computer in the control system. Application software in the computer management system. Hardware components in a computer management system. Programmable logic controllers in computer control system. Application of Microcontroller Systems in Management Processes.				
<i>Practical classes</i>				
A/D conversion; D/A conversion; Converters of temperature, pressure, displacement, acceleration, force; Control computer system components; Architecture of microcontroller systems, acquisition cards; Programmable Logic Controller, DL105, Schneider; Microcontroller Development Systems, Microchip PIC18F4xxx.				
Literature:				
1.	<i>Computer Control: An Overview</i> , Bjorn Wittenmark, Karl-Erik Arzen, Karl Johan Astrom, International Federation of Automatic Control, 2002			
2.	<i>Mastering the FreeRTOS Real Time Kernel: A Hands-On Tutorial Guide</i> , Richard Barry, Real Time Engineers Ltd. 2016			
3.	<i>PIC Microcontrollers: Programming in C</i> , Milan Verle			
4.				
5.				
Number of active teaching hours				
Lectures:	Practice:	Other forms of classes:	Other classes	Independent work:
3	2	1		Case study:
Teaching methods:				
consultations, independent individual work				
Examination methods (maximum 100 points)				
Exam prerequisites	No. of points:	Final exam	No. of points:	
Student's activity during lectures	15	oral examination		
Practical classes		written examination	30	
Colloquiums	25			
Seminars/homework	30			
Grading system				
Grade	No. of points:	Description		
10	91-100	Excellent		
9	81-90	Exceptionally good		
8	71-80	Very good		
7	61-70	Good		
6	51-60	Passing		
5	less than 50	Failing		