

Study program: Computer and software engineering, Mechatronics				
Type and level of studies: Undergraduate academic studies				
Course unit: Microcontroller Systems				
Teacher in charge: Uroš Pešović, teaching assistant Dejan Vujičić				
Language of instruction: English				
ECTS: 6				
Prerequisites: -				
Semester: Summer				
<i>Course unit objective:</i> The aim of this course is to acquaint students with the architectures of microcontroller systems, the structure and functions of peripheral units of microcontrollers; designing the hardware environment of the microcontroller system: interfaces with sensors, actuators, input-output devices; software development for microcontrollers in assembly and high-level languages.				
<i>Learning outcomes of Course unit</i> The student should be able to select a microcontroller for a specific application in a microcontroller system; designs microcontroller systems and connects input-output devices and to achieve communication with other parts of the system, writes a program that tests all hardware components of the microcontroller system, writes an executable program for a specific application of the microcontroller system				
Course unit contents <i>Theoretical classes</i> Architecture of modern microcontroller systems Special and general purpose registers, instructions, data types and microcontroller operating modes Microcontroller memory system Analog and digital input-output ports, microcontroller peripherals Communication protocols in microcontroller systems <i>Practical teaching</i> Microcontroller instruction architecture and assembly instructions. I/O digital pin configuration and interrupt initialization. Timers, counters and PWM signal generation. Serial communication modules				
Literature [1] Joseph Yiu, The Definitive Guide to ARM Cortex-M0 and Cortex-M0+ Processors, Second Edition, Elsevier, 2015, ISBN: 978-0-12-803277-0 [2] Alexander Dean, Embedded Systems Fundamentals with Arm Cortex-M based Microcontrollers: A Practical Approach, ARM Education Media UK , 2017, ISBN 978-1-911531-03-6				
Number of active teaching hours				Other classes
Lectures: 2	Practice:2	Other forms of classes:	Independent work:	
Teaching methods: consultations, independent work				
Examination methods (maximum 100 points)				
Exam prerequisites	No. of points:	Final exam	No. of points:	
Student’s activity during lectures	10	oral examination	25	
Practical classes	15	written examination	25	
Seminars/homework	35			
Project				
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	