

Specification for the book of courses

Study program		Electrical Engineering and Computer Science		
Module		Electronics - Electronic Circuits and Embedded Systems		
Type and level of studies		Undergraduate Academic Studies		
The name of the course		ARM Controllers Programming		
Lecturer (for lectures)		Petrović D. Branislav		
Lecturer/associate (for exercises)		Nikolić S. Goran		
Lecturer/associate (for OFE)		Nikolić S. Goran		
Number of ECTS	5	Course status (obligatory/elective)	Elective	
Prerequisites				
Course objectives	Introducing students with the architecture of the most frequently used advanced microcontrollers and acquiring basic knowledge for the practical application and programming of advanced embedded microcontroller systems using assembler, C and C ++ language.			
Course outcomes	Knowing the architecture of advanced microcontrollers and acquiring knowledge for application in embedded applications.			
Course outline				
Theoretical teaching	<p>Basic ARM architecture. Overview Cortex-M3 / M4: registers, modes, NVIC, memory card, bus, MMU, interrupts and exceptions, debugging support. instructions.</p> <p>Application of Cortex-M3 / M4. Programming: Asembler, C and C ++ language, data memory, semaphores, bit band. Exception programming: use of interrupts, servers, software interruptions. System timer, power management, multiprocessor communication. NXP LPC1768: embedded peripherals architecture. Development tools: MDK-ARM, C / C ++ compiler, uVision, RTX operating system, CAN interface, USB interface, File system, TCP / IP network environment, graphical environments. CMSIS standard - software interface.</p> <p>Application of Cortex-M3 / M4. Programming: Asembler, C and C ++ language, data memory, semaphores, bit band. Exception programming: use of interrupts, servers, software interruptions. System timer, power management, multiprocessor communication. NXP LPC1768: embedded peripherals architecture. Development tools: MDK-ARM, C / C ++ compiler, uVision, RTX operating system, CAN interface, USB interface, File system, TCP / IP network environment, graphical environments. CMSIS standard - software interface.</p>			
Practical teaching (exercises, OFE, study and research)	Development systems, Asembler, C and C ++ languages, program loading. Work with built-in peripherals. Implementing an embeded operating system. Using the MDK Keil RealView Tool. Development system based on Mbed module.			
Textbooks/references				
1	The Definitive Guide to the ARM Cortex-M3, Joseph Yiu, Newnes, 2009, ISBN: 978-1-85617-963-8.			
2	Selected articles. Keil documentation.			
3				
4				
5				
Number of classes of active education per week during semester/trimester/year				
Lectures	Exercises	OFE	Study and research work	Other classes
2	1	1	0	0
Teaching methods	Lectures; Practical exercises; Laboratory exercises; Homework; Colloquiums; Seminary work; Consultations.			
Grade (maximum number of points 100)				
Pre-exam duties	Points	Final exam	Points	
Activity during lectures	10	Written exam	20	
Exercises	15	Oral exam	20	
Colloquia	20			
Projects	15			