



MEĐIMURSKO VELEUČILIŠTE U ČAKOVCU

MEĐIMURJE UNIVERSITY OF APPLIED SCIENCES IN ČAKOVEC

COURSE SYLLABUS

ACADEMIC YEAR: 2025/2026

1. GENERAL COURSE INFORMATION

1.1 Course name	Computer architecture			
1.2 Study program/s	Undergraduate professional study of Computer Science			
1.3 Course status (O,E)	O	1.6 Mode of instruction (number of hours)	Lectures	30
1.4 Course code			Exercises	45
1.5 Course abbreviation			Seminars	
1.6 Semester	III		E-learning	Merlin
1.7 ECTS	6	1.7 Place and time of instruction	The premises of the Međimurje University of Applied Sciences in Čakovec, according to the schedule published on the website	

2. TEACHING STAFF

2.1 Course leader/s-title	Jurica Trstenjak, senior lecturer	contact	jtrstenjak@mev.hr
		contact	
2.2 Assistant/s- title		contact	
		contact	
2.3 Instruction held by- title	Jurica Trstenjak, senior lecturer	contact	jtrstenjak@mev.hr
2.4 Course leader/s-title		contact	

3. COURSE DESCRIPTION

3.1. Course goals	The student should get acquainted with the components that make up the computer as a whole, different computer architecture, how to execute instructions and programming in machine code.			
3.2 Prerequisites	To take the course, it is necessary to pass the courses Digital Electronic Circuits and Computer Applications			
3.3 Course outcomes	<p>After successfully completing the course, students will be able to:</p> <p>O1 - Explain the building blocks of the computer and the architecture of the Atmel Atmega328p microcontroller</p> <p>O2 - Draw the connection of digital inputs and outputs with a microcontroller</p> <p>O3 - Create an assembler program that uses input-output circuits and arithmetic logic operations</p> <p>O4 - Create a program in assembler that uses timing and interrupts</p>			
3.4 Contribution of the course to the study program	Analyze basic elements of electrical engineering and digital circuits and identify computer architecture			
3.5 Course content	The course presents contents related to working with the database through objects, stored tasks, permissions and access controls. In the practical part, open source tools are used.			
3.6 Types of coursework	X	Lectures	X	Exercises
			Blended e-learning	X
				Individual activities
				Laboratory

		Seminars and workshops		Distant learning	X	Field classes		Multimedia and network		Mentorship																											
		Other																																			
3.7 Language of instruction	Croatian																																				
3.8 Monitoring students' work (enter the number of ECTS credits for each activity so that the total number of ECTS credits is equal to the total ECTS value of the course, 1 ECTS = 30 hours)	1,00	Class attendance		Seminars		Research																															
	2,00	Midterm exams/written exam		Project		Essay																															
	1,00	Oral exam	2,00	Practical task																																	
	<table border="1"> <thead> <tr> <th>Activity specification</th> <th>Percent %</th> <th>Points</th> </tr> </thead> <tbody> <tr> <td colspan="3" style="text-align: center;">Assessment during instruction</td> </tr> <tr> <td>Attendance</td> <td>10%</td> <td>10</td> </tr> <tr> <td>Seminar/ project/ essay</td> <td>30%</td> <td>30</td> </tr> <tr> <td>Midterm exam 1</td> <td>30%</td> <td>30</td> </tr> <tr> <td>Midterm exam 2</td> <td>30%</td> <td>30</td> </tr> <tr> <td colspan="3" style="text-align: center;"><i>Exam assessment for the students who failed to fulfil all the obligatory requirements during the semester</i></td> </tr> <tr> <td>Written exam</td> <td>60%</td> <td>60</td> </tr> <tr> <td>Total:</td> <td>100%</td> <td>100</td> </tr> </tbody> </table> <p><i>Points Grade</i> 89 – 100 excellent (5) 76 – 88 very good (4) 63 – 75 good (3) 50 – 62 pass (2) 0 – 49 fail (1)</p>											Activity specification	Percent %	Points	Assessment during instruction			Attendance	10%	10	Seminar/ project/ essay	30%	30	Midterm exam 1	30%	30	Midterm exam 2	30%	30	<i>Exam assessment for the students who failed to fulfil all the obligatory requirements during the semester</i>			Written exam	60%	60	Total:	100%
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3.9 Specific features related to taking the course	<p><i>If a student collects 50% of the points of each outcome he/she directly accesses the oral exam. If a student does not achieve a sufficient number of points on the midterm exam, he/she cannot take the next midterm exam, and has to take the written exam.</i></p> <p><i>If he/she passes the written exam, he/she will proceed to the oral part of the exam.</i></p> <p><i>The seminar paper is submitted within the agreed deadline, and certainly before the exam term.</i></p> <p><i>The final grade is given on the oral part of the exam.</i></p>																																				
3.10 Students obligations	<ul style="list-style-type: none"> a full-time student has the right to sit for the exam if he attends classes for a minimum of 70% of the total prescribed number of hours a full-time student who attends classes from 50 to 70% of the total prescribed number of hours can exercise the right to take the exam by completing additional teaching activities in agreement with the course teacher a full-time student who attends a certain course for less than 50% of the prescribed number of hours enrolls in the course the following academic year a part-time student has the right to sit for the exam if he/she attends classes for a minimum of 30% of the total prescribed number of hours a part-time student who attends classes for 20 to 30% of the total prescribed number of hours can exercise the right to sit for the exam 																																				

	<p>by completing additional teaching activities in agreement with the course teacher</p> <ul style="list-style-type: none"> a part-time student who attends the classes of a certain course for less than 20% of the prescribed number of hours re-enrolls in the course the following academic year 	
3.11 Written assignments		
3.12 Required reading	<p>Slobodan Ribarić: Arhitektura mikroprocesora, Tehnička knjiga, Zagreb, 1982. Zoran Vrhovski: MIKROUPRAVLJAČI, Bjelovar 2020.</p>	
3.13 Additional reading	<p>Atmel Corporation : 8-bit AVR Microcontroller with 32K Bytes In-System Programmable Flash, San Jose , 2016 Atmel Corporation : AVR Instruction Set Manual, San Jose , 2016</p>	
4. ADDITIONAL INFORMATION ABOUT THE COURSE		
4.1 Quality control	The quality of the program, teaching process, teaching skills and level of mastery of the material will be established by conducting a written evaluation based on questionnaires, and in other standardised ways and in accordance with the by-laws of the Međimurje University of Applied Sciences in Čakovec.	
4.2 Contact the teacher	Students can contact the teacher during the office hours and during classes. All other methods of communication are arranged with the teacher. It is also possible to ask questions by e-mail, which will be answered in 48 hours at the latest. It is desirable for students to come as often as possible for any possible questions during the teacher's office hours.	
4.3 Information about the course	It is the obligation of each student to be regularly informed about the course. All notifications about the classes or possible postponement of classes will be posted on the bulletin board and on the website of the University at least 24 hours in advance.	
5. ELABORATION OF THEMATIC UNITS		
Week	Topic	Course outcome
1.	Introduction to the content of the course, Microcomputers. 'On-line' and 'Off-line' systems	O1
2.	Computer building components (sensors, analog signal processing, multiplexers).	O1
3.	Computer building components (AD, DA, interface, executive members).	O1
4.	Microprocessor architecture. CISC, RISC.	O2
5.	Microprocessor instructions, execution phases, microcode.	O1,O2
6.	Microprocessor instructions, execution phases, microcode.	O1,O2
7.	Architecture of the Atmel ATmega328P microcontroller (clock, special purpose registers, input/output ports, timing scope, interrupt system). Development environment for the design of microcontroller systems (Atmel Studio 7.0).	O3
8.	Colloquium	
9.	Atmel ATmega328P microcontroller instructions	O3
10.	The process of creating, writing assembly code, translating it into executable form. Development cycle, logical design of the program.	O3
11.	Programming input/output circuits	O3
12.	Writing program macros	O3
13.	Examples of program solving of arithmetic and logical operations	O3,O4
14.	Use of interrupts and timing	O4
15.	Colloquium	