



DISCIPLINE ACADEMIC SHEET
ACADEMIC YEAR 2025 – 2026

1. PROGRAMME DATA

1.1. Higher Education Institution	UNIVERSITY OF CRAIOVA
1.2. Faculty	Automation, Computers and Electronics
1.3. Department	Computers and Information Technology
1.4. Field of Study	Computers and Information Technology
1.5. Study level	L(License / Undergraduate)
1.6. Organizational form	IF
1.7. Study Program (name/code) /Qualification	Computers / L2060101010

2. Discipline data

2.1 Discipline Name	Microprocessor Design						
2.2 Course Activities Holder	Lemeni Ioan						
2.3. Practical Activities Holder	Lemeni Ioan						
2.4. Study Year	III	2.5. Semester	II	2.6. Evaluation type	E	2.7. Discipline regime	DOB

3. Estimated total time (hours per semester of teaching activities)

3.1. Number of hours per week	4	in which: 3.2 course	2	3.3. sem./lab./pr.	0/2/0
3.4. Total hours of curriculum	56	in which: 3.5 course	28	3.6. sem./lab./pr.	0/28/0
Time distribution - hours/week					
Study after manual, course support, bibliography and notes					14
Additional documentation in library, on specialized electronic platforms and field					7
Training seminars / labs, homework, portfolios and essays					14
Tutorial					
Examinations					4
Other activities: consultation					5
3.7. Total hours per individual activities					44
3.8. Total hours per semester					100
3.9. Number of credits					4

4. Preconditions (where appropriate)

4.1. of curriculum	•
4.2. of competence	•

5. Conditions (where appropriate)

5.1. of the course	•
5.2. of seminar/ laboratory/project	•

6. COURSE OBJECTIVES – expected learning outcomes that are supported by completing and passing the course

Knowledge	Student/Graduate: The student describes, identifies, summarizes elementary concepts and methods regarding the analysis, design and testing of computing systems with microcontrollers or processors.
Skills (Abilities)	Student/Graduate: The student designs and implements functional systems of low/medium complexity with microprocessors.
Responsibility and autonomy	Student/Graduate: The student shows a spirit of initiative and action to update professional, economic and organizational culture knowledge.

7. Content

<i>7.1. Course</i>	The method of implementation	Teaching methods	Allocated time (hours)
1. Memory modules, ports, address decoding, typical structure of an application, memory space classification.	face to face	Participatory lecture	4
2. The architecture of ATmega16 microcontroller, memory map, digital ports, port extension, ADC	face to face	Participatory lecture	4
3. Polling, switches and push buttons, mini keyboard hardware and software interface	face to face	Participatory lecture	4
4. Timer/counters in general. Specific implementation of timer/counters in ATmega16.	face to face	Participatory lecture	6
5. The interrupt system. Specific implementation of the interrupt system in ATmega16. Example: 7segments multiplexed display	face to face	Participatory lecture	6
6. Serial interfaces.	face to face	Participatory lecture	4
Bibliography:			
1. Atmel Corporation – AVR Instruction Set Manual			
2. Atmel Corporation – ATmega16(L) - Datasheets – Complete			
3. Barnett R., O’Cull L. and Cocs S. – C Programming and the Atmel AVR, 2e, Delmar, Cengage Learning 2007			
4. Morton J. – AVR An Introductory Course, Newnes 2002			
5. Rafiquzzaman M. – Microprocessor and Microcomputer Based System Design, CRC Press 1990			

<i>7.2. Seminar/laboratory/project</i>	The method of implementation	Teaching methods	Allocated time (hours)
1. SimulIDE simulator.	face to face	Practice and discussion	2
2. Using breadboard and laboratory equipment.	face to face	Practice and discussion	2
3. Building a minimal ATmega16 microsystem and writing a very simple application (LED blinking).	face to face	Practice and discussion	2
4. Connecting LEDs and switches. Logic functions implementation.	face to face	Practice and discussion	2

5. Connecting 7 segment displays. Logic functions implementation using lookup tables.	face to face	Practice and discussion	2
6. Connecting an LCD.	face to face	Practice and discussion	2
7. ADC. Connecting a temperature sensor.	face to face	Practice and discussion	2
8. Connecting a mini keyboard.	face to face	Practice and discussion	2
9. State machines. Simple application with LCD and keyboard: intercom	face to face	Practice and discussion	2
10. Timers. Digital clock application.	face to face	Practice and discussion	2
11. Timers. PWM	face to face	Practice and discussion	2
12. The interrupt system. Digital watch management using interrupts.	face to face	Practice and discussion	2
13. Redoing a missing lab.	face to face	Practice and discussion	4
Bibliography:			
1. Ibrahim D. – Using LEDs, LCDs, and GLCDs in microcontroller projects, Wiley 2012			

8. Correlating the content of the discipline with the expectations of representatives from the epistemic community, professional associations and representative employers in the field related to the program

Course content is adapted to meet the requirements of the labor market area covered by the license curricula, as agreed by the social partners, professional associations and employers

9. Evaluation

Activity Type	9.1 Evaluation criteria	9.2 Evaluation methods	9.3 Final mark weight
9.4 Course	-	-	-
9.5 Laboratory	-	-	-
	Continuous assessment of individual work	Each practical activity (lab) involves solving several tasks. The tasks are mandatory and must be carried out in a single lab (2hrs.). If one fails to finish the mandatory tasks, he/she will redo the lab. A single lab can be redone.	0-20%
		Seven labs each contain an additional task which is optional. Solving the optional task is worth 0.5 points. The sum of all points gained from solving the additional tasks is called bonus and will be added to the grade of the written test. The bonus is limited to two points.	
9.6 Minimum standard of performance			
Exam: written paper. The condition for participation in the written test is the resolution of the mandatory tasks for each laboratory work.			
Grading: The final grade is calculated based on S and B where:			
– S: the grade in the written test.			
– B: Bonus: for performing an additional task at a laboratory session, 0.5 bonus points are awarded. The bonus points add up and form the total bonus. Bonus B is calculated with formula $B=\min(2, \text{total_bonus})$.			
– for passing the exam it is mandatory that $S \geq 4.5$			
– if $4,5 \leq S < 5$, final grade = 5			
– if $S \geq 5$, final grade = $\min(10, \text{round}(S+B))$			

Date of Completion	Signature of the Course Activities Holder,	Signature of the Practical Activities Holder,
23.08.2025		

Date of Approval in the Department	Signature of the Department Director,
25.08.2025	Ş.l.dr.ing. Nicolae ENESCU

Date of Approval in the Faculty	Signature of the Dean,
	Prof.dr.ing. Dorin ŞENDRESCU