



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	Embedded programming						
2.2 Course Activities Holder	Dumitrașcu Eugen						
2.3. Practical Activities Holder	Vrăjitoru Nicolae						
2.4. Study Year	2	2.5. Semester	2	2.6. Evaluation type	E	2.7. Discipline regime	DFA

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
3.7. Time distribution - hours/week					hours
Study after manual, course support, bibliography and notes					2
Additional documentation in library, on specialized electronic platforms and field					8
Training seminars / labs, homework, portfolios and essays					8
Tutorial					0
Examinations					1
Other activities.....					0
Total hours per individual activities					19
3.8. Total hours per semester					75
3.9. Number of credits					3

4. PRECONDITIONS (where appropriate)

4.1. of curriculum	• Computer Programming, Logical Design, Computer Architecture
4.2. of competence	• Programming in C language

5. CONDITIONS (where appropriate)

5.1. of the course	• The course is presented in Power Point with a video projector and certain examples are detailed on the board in the classroom.
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5.2. of seminar/ laboratory/project	The laboratories are held in the specially designed room for the Hardware and Embedded Systems disciplines. The laboratory work is carried out with Arduino boards and simulations with Wokwi.
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6. COURSE OBJECTIVES – expected learning outcomes that are supported by completing and passing the course

Knowledge	Student/Graduate: Describes and identifies the architecture of embedded systems, the fundamentals of embedded programming, including memory management, interaction with peripherals, and uses programming languages specific to embedded and intelligent systems in the field of computer science and information technology, as well as their application in concrete problems.
Skills (Abilities)	Student/Graduate: - Will have skills in using programming languages, environments and technologies and specific tools (algorithms, schemes, models, protocols, etc.) in solving well-defined problems in embedded systems programming. - Models at the embedded system level and creates interfaces and systems based on microcontrollers and microprocessors, using integrated hardware - software design (co-design) and programming engineering. - Evaluates and selects, adapts and extends computer-aided design (CAD) tools, hardware packages and dedicated software, for the implementation of embedded systems. - Develops effective teamwork skills for the development of integrated solutions in the embedded field.
Responsibility and autonomy	Student/Graduate: - Shows a spirit of initiative and action to update professional, economic and organizational culture knowledge. - Applies good practices in embedded systems development, including writing efficient and well-documented code.

7. CONTENT

7.1. Course	The method of implementation	Teaching methods	Allocated time (hours)
1. Introduction to Embedded Systems	face to face	PowerPoint presentation	4
2. Memory Layout in C language. Data Storage and Conversions between Different Data Types	face to face	PowerPoint presentation	4
3. Operators in C language	face to face	PowerPoint presentation	2
4. User-Defined Data Types. Structures and Unions in C language	face to face	PowerPoint presentation	4
5. Functions and Macros	face to face	PowerPoint presentation	4
6. Pointers. Pointer Arithmetic	face to face	PowerPoint presentation	4

7. Arrays. Memory Storage Classes and Data Modifiers	face to face	PowerPoint presentation	4
8. Static Code Analysis	face to face	PowerPoint presentation	2
Bibliography:			
1. <i>C for Engineers and Scientists: An Introduction to Programming with ANSI C</i> , Bronson, G.J., 1992, West Publishing Company			
2. <i>A First Book of ANSI C, Fourth Edition (Introduction to Programming) 4th Edition</i> , Bronson, G.J., 2007, Cengage Learning			
3. <i>The C Programming Language, Second Edition</i> , Kernighan, B.W., Ritchie D.M., 1988, Prentice Hall			
4. <i>The C Book</i> , Banahan, M., Brady, D., Doran, M., 1991			
5. <i>Making Embedded Systems</i> , 2024, O'Reilly			

7.2. Seminar/laboratory/project	The method of implementation	Teaching methods	Allocated time (hours)
Laboratory			
1. Introduction to Microcontrollers and Arduino	face to face	Laboratory sessions with Arduino implementation examples	2
2. Digital and Analog Inputs and Outputs	face to face	Laboratory sessions with Arduino implementation examples	4
3. PWM Signals. Applicability in Arduino	face to face	Laboratory sessions with Arduino implementation examples	4
4. Reading Analog Values - ADC	face to face	Laboratory sessions with Arduino implementation examples	2
5. Introduction to Displays - 7-Segments	face to face	Laboratory sessions with Arduino implementation examples	4
6. LCD Display with I2C Interface	face to face	Laboratory sessions with Arduino implementation examples	4
7. Simple User Interface: Buttons and Menus on LCD	face to face	Laboratory sessions with Arduino implementation examples	4
8. Parking System - Radar	face to face	Laboratory sessions with Arduino implementation examples	4
Bibliography:			
1. <i>Arduino Course</i> , 2024, Robofun			

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

The *Embedded Programming* discipline can be directly correlated with the expectations of all stakeholders through the balance between theory and practice, the integration of professional standards, the use of real equipment, and the development of adaptability and problem-solving skills, so that graduates are relevant both academically and professionally.

9. EVALUATION

Activity Type	9.1. Evaluation criteria	9.2. Evaluation methods	9.3. Final mark weight
9.4. Course	Question grid	Written exam	50%
9.5. Seminar/laboratory/project	L: Practical laboratory work and final project	Grading during laboratory work and evaluation of the final project	50%
9.6. Minimum standard of performance			
The grade of the written exam will have a weight of 50% of the final grade The average obtained in the laboratory work and the final project will have a weight of 50% of the final grade. The minimum weighted average is 5.			

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	Ș.l.dr.ing. Nicolae ENESCU

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