SYLLABUS

1. Data about the program of study

1.1	Institution	Technical University of Cluj-Napoca
1.2	Faculty	Faculty of Electrical Engineering
1.3	Department	Electrotechnics and Measurements
1.4	Field of study	Electrical Engineering
1.5	Cycle of study	Bachelor of Science
1.6	Program of study/ Qualification	Electrical System Cluj-Napoca in English language
1.7	Form of education	Full time
1.8	Subject code	5

2. Data about the subject

2.1	Subject name	Computer programming and programming languages I
2.2	Course responsible/ lecturer	*Assoc. Prof. Eng. Simona Vlad – simona.vlad@ethm.utcluj.ro*
2.3	Teachers in charge of Seminars/ Laboratory/ Project	Lecturer *Eng. Claudia Constantinescu – claudia.constantinescu@ethm.utcluj.ro*

2.4 Year of study	I	2.5 Semester	1	2.6 Type of assessment *(E – exam, C – colloquium, V – verification)*	E

2.7 Subject category	*DF – fundamental, DD – in the field, DS – specialty, DC – complementary*	DF
	DI – compulsory, DO – elective, Dfac – optional	DI

3. Estimated total time

3.1 Number of hours per week:	4	of which	3.2 Course	2	3.3 Seminar		3.3 Laboratory	2	3.3 Project	
3.2 Total hours per semester	56	of which	3.5 Course	28	3.6 Seminar		3.6 Laboratory	28	3.6 Project	

3.7 Individual study:	
(a) Manual, lecture material and notes, bibliography	24
(b) Supplementary study in the library, online and in the field	17
(c) Preparation for seminars/laboratory works, homework, reports, portfolios, essays	18
(d) Tutoring	6
(e) Exams and tests	4
(f) Other activities	0

3.8 Total hours of individual study *[sum (3.7(a) to 3.7(f))]*	69
3.9 Total hours per semester *[sum of 3.4 and 3.8]*	125
3.10 Number of credit points	5

4. Prerequisites (where applicable)

4.1	Curriculum	-
4.2	Competences	-

5. Requirements (where appropriate)

5.1	For the course	Projector
5.2	For the applications	In a computer room

6. Specific competences

Professional competences	- Ability to identify, formulate, and solve engineering problems in a systems approach. - Ability to apply knowledge of engineering, engineering sciences and applied computer science. - The ability to use the modern engineering techniques, skills, and tools necessary for engineering practice. - Ability to operate with fundamental concepts from computer science and information technology
Cross competences	- Ability to work in a team, communicate effectively, and understand professional and ethical responsibilities. - Flexibility in approaching and using in practice the latest existing technologies in the assumed areas of competence

7. Discipline objectives (based on specific competencies acquired)

7.1	General objective	Development of algorithmic thinking and of the ability to create, implement, debug and test programs in C/C++ to solve simple problems
7.2	Specific objectives	• Development of algorithms for solving problems in the field of medical engineering • Implementation of algorithms in the C/C++ programming language to solve problems in the field of engineering; • Debugging and testing of the programs made

8. Contents

8.1. Course (Lectures)		Number of hours	Teaching methods	Additional remarks
1	Introduction: Hardware, Software, Algorithms	2		
2	Algorithms. Programs structure in C	2		
3	Data types	2		
4	Input/output functions	2		
5	Operators in C.	2		
6	Conditional statements	2	Slide-based and blackboard presentation, debate	
	Repetitive statements	2		
	Define and call user functions	2		
	Arrays	2		
	Search and sorting algorithms	2		
	Recursion. Types of variables	2		
	Predefined libraries and pre-processing directives	2		
	Examples. Special lists: stack, tail	2		
	Recap	2		

Bibliography

1. Paul Deitel, Harvey Deitel, "C How to program", 6th edition, Pearson Education 2010
2. Brian Kernighan, Dennis Ritchie, „The C Programming Language", 2nd edition, Prentice Hall,1988
3. www.programmingtutorials.com/default.aspx
4. www.codeblocks.org
5. freecomputerbooks.com/langCBooks.html

6. any other C book or C programming tutorial			

8.2. Applications - Seminar /Laboratory/Project		Number of hours	Teaching methods	Additional remarks
1	Algorithms - simple logic schemes	2	Coordination, discussions on solving methods, assistance in creating programs	
2	Algorithms - decision blocks	2		
3	Algorithms – loops	2		
	Input/output functions	2		
	Using operators in C	2		
	Conditional statements (if, switch)	2		
	Repetitive statements (for, while, do/while)	2		
1	Defining and calling functions (1)	2		
2	Defining and calling functions (2)	2		
3	Application using an Arduino microcontroller	2		
	One-dimensional arrays	2		
	Two-dimensional arrays	2		
	Search and sorting algorithms	2		
	Recap	2		

Bibliography
1. Paul Deitel, Harvey Deitel, "C How to program", 6th edition, Pearson Education 2010
2. Brian Kernighan, Dennis Ritchie, „The C Programming Language", 2nd edition, Prentice Hall,1988
3. www.programmingtutorials.com/default.aspx
4. www.codeblocks.org
5. freecomputerbooks.com/langCBooks.html
6. any other C book or C programming tutorial

9. **Alignment of course content with expectations of the epistemic community, professional associations, and representative employers in the field**

The content of the discipline is in accordance with what is taught in other faculties in the field, both in the Technical University and in other university centers in the country and abroad. In order to better adapt the content of the discipline to the requirements of the labour market, meetings were held with both representatives of the business environment and computer science teachers from the Cluj pre-university education.

10. **Assessment**

Activity type	10.1 Assessment criteria	10.2 Assessment methods	10.3 Weight in the final grade (%)
10.4 Course	- the ability to interpret code sequences; - the ability to create programs to solve problems, using user functions	- final test from code sequences	40%
		- Final test from problems	30%
10.5 Laboratory	- the ability to use input/output functions,	- 4 practical laboratory tests during the semester	30%

		basic instructions, user functions, switchboards, in solving problems; - the ability to create, implement, debug and test the program.		

10.6 Minimum standard of performance:

• average 5 in the tests during the semester, grade 5 in the final test from code sequences (50% of the total code sequences solved correctly) and the correct resolution of one of the two problems in the exam

Date of completion	Lecturers	Title/ Surname/ Name:	Signature
September 2024	Course	Assoc. Prof. Eng. Simona Vlad	
	Applications Laboratory	Lecturer Eng. Claudia Constantinescu	

Date of approval in the ETHM Department Council September 2024	**Head of Department:** Prof. Eng. MICU Dan Doru, PhD
Date of approval in the Faculty of Electrical Engineering Council September 2024	**Dean:** Assoc. Prof. Eng. CZIKER Andrei, PhD