Syllabus

1. Data about the program of study

1.1 Institution	Technical University of Cluj-Napoca
1.2 Faculty	Automation and Computer Science
1.3 Departament	Automation
1.4 Field of study	Systems Engineering
1.5 Cycle of study	Bachelor of Science
1.6 Program of study/Qualification	Automation and Applied Informatics (English)
1.7 Form of education	Full time
1.8 Codul disciplinei	5.00

2. Data about the subject

2.1 Subject name	***Computer Programming and Programming Languages***				
2.2 Course responsible/lecturer	Lecturer dr. eng. Sanislav Teodora – teodora.sanislav@aut.utcluj.ro				
2.3 Teachers in charge of applications	Lecturer dr. eng. Sanislav Teodora – teodora.sanislav@aut.utcluj.ro				
2.4 Year of study	1	2.5 Semester	1	2.6 Assessment *(E/C/V)*	E
2.7 Type of subject	*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:	Course	2	Seminar	-	Laboratory	2	Project	-
3.2 Number of hours per semester	56	of which:	course	28	Seminar	-	Laboratory	28	Project	-
3.3 Individual study										
(a) Manual, lecture material and notes, bibliography										46
(b) Supplementary study in the library, online and in the field										12
(c) Preparation for seminars/laboratory works, homework, reports, portfolios, essays										6
(d) Tutoring										2
(e) Exams and tests										3
(f) Other activities:										0

3.4 Total hours of individual study (sum of (3.3(a)…3.3(f)))	69
3.5 Total hours per semester (3.2+3.4)	125
3.6 Number of credit points	5

4. Pre-requisites (where appropriate)

4.1 Curriculum	N/A
4.2 Competence	Mathematics - baccalaureate level, Mathematics-Informatics profile (M1)

5. Requirements (where appropriate)

5.1. For the course	Amphitheater with appropriate equipment to support an ongoing lecture (multimedia equipment)
5.2. For the applications	The attendance at the laboratory classes is mandatory.

6. Specific competences

6.1 Professional competences	• C2 – Operating with fundamental concepts from Computer Science, Information and Communication Technology ○ C2.1 - Description of the operation and structure of computer systems, communication networks and their applications in systems engineering using knowledge of programming languages, programming environments and technologies, programming engineering and specific tools (algorithms, schemes, models, protocols, etc.).
6.2 Cross competences	N/A

7. Course objectives

7.1 General objective	• Operating with fundamental concepts from computer science
7.2 Specific objectives	• The study of the steps necessary to solve a problem • Algorithm description in a pseudocode type language • The study of the C programming language • Developing applications in the C programming

8. Contents

8.1 Lecture	No.hours	Teaching methods	Notes
Introduction. Short history. Hardware components.	2	Lectures, multimedia presentations, presentation of applications written in C programming language	N/A
Steps to solve a problem. The C programming language – Introduction. Variables. Expressions.	2		
Arrays. Statements.	2		
Functions. Header files.	2		
Pointers. Pointer operations.	2		
Structure. Union. Enumeration.	2		
Bit fields. Functions on characters and strings. Functions from the C standard library.	2		
Files.	2		
Recursion. Functions with a variable number of arguments.	2		
Modular programming.	2		
The preprocessor. Preprocessor directives. Assembly in C.	2		
Some concepts of concurrent programming. Embedded systems.	2		
Syntactic and semantic errors in C.	2		
Review.	2		

Bibliography

I. Ignat, C.L. Ignat, "Programarea calculatoarelor – Descrierea algoritmilor și fundamentele limbajului C/C++", Ed. Albastră, Cluj-Napoca, 2005
Liviu Negrescu, "Limbajele C şi C++ pentru începători", Vol. I part I and part II, Ed. Albastră, Cluj-Napoca, 1995
P. Deitel, H. Deitel, "C – How to Program", Prentice Hall, Ed. VIII, 2016

8.2 Aplications (seminar/laboratory/project)	No.hours	Teaching methods	Notes
Laboratory:	-	In class problem solving on the whiteboard and on the computer (interactive), errors correction	N/A
Using Codeblocks IDE. Exercises solved in a pseudocode type language.	2		
C Input/Output.	2		
Expressions.	2		
Statements.	2		
Functions.	2		
Pointers and dynamic allocation (I).	2		
Pointers and dynamic allocation (II).	2		
Structures, unions, enumerations.	2		
String manipulation.	2		
Files.	2		
Recursion.	2		
Modular programming.	2		
Review.	2		
Laboratory Test.	2		

Bibliography

1. Iosif Ignat, "Programarea calculatoarelor. Îndrumător de laborator", UT Press.
2. Laboratory materials available at http://users.utcluj.ro/~tsanislav/teaching.html.

9. Bridging course contents with the expectations of the representatives of the community, professional associations and employers in the field

The contents of the course help the students to create the necessary bases for the further development of applications in the field of industrial informatics.

10. Evaluation

Activity type	Assessment criteria	Assessment methods	Weight in the final grade
Course	40% theoretical part, 60% applied part	Written exam onsite, online exam if the epidemiological situation requires it	60%
Seminar	-	-	-
Laboratory	100% applied part	Computer test onsite, online if the epidemiological situation requires it	40%
Project	-	-	-
Minimum standard of performance: • Each component of the final grade must be passed with at least grade five.			

Date of filling in:		**Title Firstname NAME**	**Signature**
03.06.2024	Course	Lecturer dr. eng. Teodora SANISLAV	
	Applications	Lecturer dr. eng. Teodora SANISLAV	

Date of approval by the Department of Automation Board ____ . ____. 2024	Head of Departament of Automation Prof.dr.eng. Honoriu Vălean
Date of approval by the Faculty of Automation and Computer Science Council ____ . ____. 2024	Dean Prof.dr.eng. Mihaela Dînșoreanu