

SYLLABUS

Discipline name	Computer Programming
Profile	Electronics and Telecommunications Engineering
Specialization	Telecommunications Technologies and Systems
Code	51320409
Course leader	Professor Mircea VAIDA, Ph.D. – mircea.vaida@com.utcluj.ro
Collaborators	Assistant Professor Cosmin Striletschi, Ph.D., cosmin.striletschi@com.utcluj.ro
Department	Communications
Faculty	Electronics, Telecommunications and Information Technology

Sem.	Type of discipline	Course	Applications			Course	Applications			Ind. study	TOTAL	Credits	Form of assessment	
		[hours/week]						[hours/semester]						
			S	L	P		S	L	P					
1	Fundamental	2	-	2	-	28	-	28	-	64	120	4	Exam	

Acquired competences :

Acquired skills (what the student is able to do):

To learn about:

- basic simple algorithms
- computer architecture and programming languages
- the basic elements of the C/C++ language

To develop:

- simple algorithms in pseudocode
- C/C++ applications:
 - With simple I/O;
 - To process arrays;
 - With pointers and dynamic memory allocation;
 - With user data types;
 - With text and binary files.

Acquired abilities (what type of equipment/ instruments/ software the student is able to handle):

At the end the students will be able to:

- Know main facilities of a C/C++ IDE, VC++XE
- To execute, test an debug simple C/C++ applications

Prerequisites (if necessary):

Basic knowledge of computer science and mathematics from high school

A. Course/Lecture (course/lecture titles)

1	Introduction in computer programming- algorithms. Classification and evolution of programming languages, programming principles. Anatomy of a computer. Basic data and instructions types.
2	Introduction concerning C/C++ programming. Predefined data types in C/C++. General aggregate types: arrays, structures. Functions. Basic elements of preprocessing in C/C++.
3	Input/output operations in C/C++ (printf, scanf, cout, cin).
4	Operators in C language.
5	Control of program flow in C/C++.
6	Memory classes. Initialization of variables and arrays.
7	Arrays: uni/multi- dimensional, operations, parameters.
8	Pointers in C. Arguments transfer by address with pointers and references.
9	Pointers and arrays. Pointers to functions. String library functions. Arguments transfer to main function
10	Dynamic memory allocation in C/C++.
11	User defined data types, struct, unions, bit fields.
12	Typedef, enum. Other input/output elements in C/C++. Files in C/C++.
13	Binary files. New considerations concerning preprocessing, macro functions.
14	New considerations concerning functions in C++: inline, constant param., variable no. of parameters, overloading . Standard C library.

B. Applications – Laboratory (list of laboratories), Seminar (contents), Project (project contents)

1	The Anatomy of a Computer. Operating systems. Files. Internet.
2	Codes. Numeration systems. Pseudocode. Algorithms.

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3	Minimum C/C++ applications
4	Basic input/output operations in C/C++ (printf, scanf, cout, cin). Debugging
5	Operators and expresions in C/C++.
6	Instructions in C/C++.
7	Arrays, operations with arrays. Partial evaluation.
8	Pointers in C. Arguments transfer by address with pointers and references.
9	Pointers and arrays. Pointers to functions. Arguments transfer to main function
10	Dynamic memory allocation in C/C++.
11	Strucrures, included structures.
12	Pointers and data structures. Other user data types. Text files.
13	Binary files.
14	Final evaluation.

C. Individual study (reference study contents, synthesis materials, projects, applications etc.)

1 synthesis reports
 10 sets of problems (the preparation part in every laboratory)
 3 sets of problems (course homework)

Individual study structure	Course study	Problem solving, laboratory, project	Applications preparation	Examination time	Additional reference study	Total no. of individual study hours
Hours	28	20	5	3	8	64

References (Textbooks, courses, laboratory manual, exercise book)

In UTC-N library

- Vaida M., Bazele dezvoltarii aplicatiilor software in electronica si telecomunicatii, curs, litografia UTC-N, 1997
- Mircea-Florin Vaida, Petre G. Pop, Cosmin Striletschi, Ligia Chiorean, Calin G. Login, Tehnologii avansate privind dezvoltarea aplicatiilor software in limbajul C/C++, Casa Cartii de Stiinta, 2006
- Ligia Chiorean, Mircea-Florin Vaida, Petre G. Pop, Cosmin Striletschi, , Elemente de bază și obiectuale privind dezvoltarea aplicațiilor în limbajul de programare C/C++, pp. 380, UTPress, 2007/2008

Supplementary materials:

- English courses
- Lab. Support on the dedicated site, <http://mercur.utcluj.ro/lab> (english+romanian)

Other libraries:

- Striletschi C., Vaida M.F., Pop G.P., Chiorean Ligia, Benta K. Iulian- Tehnologii obiectuale si algoritmi de baza privind dezvoltarea aplicatiilor in limbajul C/C++, Editura Casa Cartii de Stiinta, Cluj-Napoca, 2007
- Vaida M.F., Pop G.P., Striletschi C., Chiorean Ligia, - Aplicații în limbajele C/C++ și Java, Casa Cartii de Stiinta, Cluj-Napoca, 2004.

Final evaluation

Evaluation method	Final exam will be composed by a theoretical test T (1 hour) and solving a problem on a computer P (1 hour). The laboratory will also be evaluated
Mark components	Laboratory (mark L); Theory (mark T); Problem (mark P);
Mark computation	$N = (L+T+P)/3$; is calculated only if: $T > 4$ și $P > 4$.

Course leader,

Professor Mircea-F. VAIDA, Ph.D.