


SYLLABUS
1. Study Program

1.1	Higher Education Institute	Technical University of Cluj-Napoca
1.2	Faculty	Electronics, Telecommunications and Information Technology
1.3	Department	Communications
1.4	Study domain	Electronics and Telecommunications Engineering
1.5	Study level	License
1.6	Study program/ Qualification	Telecommunications Technologies and Systems, Applied Electronics
1.7	Type of education	IF (Full-time learning)
1.8	Discipline code	TST-E04.00, EA-E04.00

2. Discipline

2.1	Discipline name		Computer Programming and Programming Languages 1									
2.2	Subject area		Electronics and Telecommunications Engineering									
2.3	Responsible		Professor: Mircea-Florin Vaida, PhD Mircea.Vaida@com.utcluj.ro									
2.4	Titular		Professor: Mircea-Florin Vaida, PhD. Collaborator: Assist.Prof. Cosmin Strilechi, PhD.									
2.5	Year of study	I	2.6	Semester	1	2.7	Evaluation	Exam	2.8	Type of discipline	DF /DI	

3. Total estimated time

Year/ Sem	Discipline name	No. of weeks	Course				Applications				Indiv. study	TOTAL	ECTS
			[hours/week]				[hours/week]						
			C	S	L	P	S	L	P				
I/1	Computer Programming and Programming Languages 1	14	2	0	2	0	28	0	28	0	69	125	5

3.1	Number of hours per week	4	3.2	course	2	3.3	applications	2
3.4	Total hours per curriculum	56	3.5	course	28	3.6	applications	28
Individual study								Hours
Study based on manuals, course materials, references and notes								51
Supplementary documentation in libraries, electronic platforms and on field								8
Preparation of seminars/laboratories, homework's, essays, portfolios								4
Tutorial work								2
Assessments								3
Other activities								1
3.7	Total hours of individual study	69						
3.8	Total hours per semester	125						
3.9	ECTS	5						

4. Prerequisites (if necessary)

4.1	Curriculum	Basic high school in mathematics, physics, computer science
4.2	Competences	Basic knowledge of computer science, physics and mathematics from high school

5. Requisites (if necessary)

5.1	Course	Video-projector, screen, whiteboard
5.2	Applications	PCs with Internet access

6. Specific competences acquired

Professional competences	Theoretical knowledge (What do the student should know)	To learn about: -basic simple algorithms -computer architecture and programming languages -the basic elements of the C/C++ language
	Acquired skills (What the student is able to do)	To develop: - simple algorithms in pseudo code - C/C++ applications: o With simple I/O; o To process arrays; o With pointers and dynamic memory allocation; o With user data types; o With text and binary files.
	Acquired abilities (what 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, Microsoft Visual Studio /C++ IDE - To execute, test an debug simple C/C++ applications
Transversal competences		CT3 Adapting to new technologies, professional and personal development through continuing education using electronic documentation and printed sources, in Romanian and in at least one international language (English). Competencies for analysis and synthesis and optimization systems thinking. Flexibility in thinking and ability to work with interdisciplinary concepts and tools.

7. Discipline objectives (based on the grid of specific competences acquired)

7.1	General objective	Development of basic competences in programming languages
7.2	Specific objectives	1. Theoretical knowledge's about C/C++ language. 2. Practical abilities to use Microsoft Visual Studio, VC++ IDE.

8. Contents

8.1. Course (titles)		Teaching methods	Observations
1	Introduction in computer programming - algorithms. Classification and evolution of programming languages, programming principles. Anatomy of a computer. Basic data and instructions types.	Presentations, discussions	Videoprojector
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	Initialization of variables and arrays. Memory classes.		
7	Arrays: one/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.		
8.2. Applications (laboratory work)		Teaching methods	Observations
1	The Anatomy of a Computer. Operating systems. Files. Internet.	Experiments, tests using PC's	Network PC's
2	Codes. Numeration systems		
3	Pseudo code. Algorithms.		
4	Minimum C/C++ applications		
5	Basic input/output operations in C/C++ (printf(), scanf(), cout, cin).		
6	Operators and expressions in C/C++.		
7	Instructions in C/C++. Debugging		
8	Arrays, operations with arrays. Partial evaluation.		
9	Pointers in C. Arguments transfer by address with pointers and references.		
10	Pointers and arrays. Pointers to functions. Arguments transfer to main() function.		
11	Dynamic memory allocation in C/C++.		
12	Structures, included structures.		
13	Pointers and data structures. Other user data types. Text files.		
14	Binary files. Final evaluation.		
References:			
In TUC-N library			
1. Vaida M., Bazele dezvoltarii aplicatiilor software in electronica si telecomunicatii, curs, litografia UTC-N, 1997			
2. Mircea-Florin Vaida, Petre G. Pop, Cosmin Strilețchi, Ligia Chiorean, Calin G. Login, Tehnologii avansate privind dezvoltarea aplicatiilor software in limbajul C/C++, Casa Cartii de Stiinta, 2006			
3. Ligia Chiorean, Mircea-Florin Vaida, Petre G. Pop, Cosmin Strilețchi, , Elemente de bază și obiectuale privind dezvoltarea aplicațiilor în limbajul de programare C/C++, UTPress, 2007/2008			
Supplementary materials:			
-English web courses site, http://helios.utcluj.ro/lab/index.php (english+romanian)			
-Lab. Support on the dedicated site, http://helios.utcluj.ro/lab/index.php (english+romanian)			
Other libraries:			
1. Mircea-Florin Vaida, Petre Gavril Pop, Cosmin Strilețchi, Ligia-Domnica Chiorean, Lenuța Alboae, Programarea în limbajul C/C++. Algoritmi de bază în C/C++, Editura: Casa Cărții de Știință, Cluj-Napoca, 2011			
2. Ligia-Domnica Chiorean, Kuderna-Iulian Bența, Mircea-Florin Vaida, Petre Gavril Pop, Cosmin Strilețchi, Elemente practice de bază pentru programarea în limbajul C/C++ - editia a doua adaugita si revizuita, Casa Cartii de Stiinta, Cluj-Napoca, 2013			

9. Discipline content corroborated with the expectations of the epistemic community representatives, associations, professional and related program employers

Acquired skills will be needed in the following possible COR occupations: electronics engineer, telecommunications engineer, system and computer design engineer, or new occupations proposed to be included in COR (sales support engineer, developer of multimedia applications, network operating engineer, test engineer, project manager, traffic engineer, communications system consultant.

10. Assessment

Type of activity	10.1	Evaluation criteria	10.2	Evaluation method	10.3	The weight of the final grade
Course		Theoretical written and oral test with questions/code		Written/oral test (T=33%)		T = 33%
Application		Solving a problem P on a computer (1 hour). The laboratory L will also be evaluated		Lab. evaluations and computer test (P=34%, L=33%)		P+L = 67%
10.4 Minimum performance standard						
The final grade (N) is calculated as average of marks obtained in the evaluation of ongoing activities and application type: $N = (T + L + P) / 3.0$. The condition for obtaining the ECTS credits is that N and all components of the final grade to be higher than or equal to 5 (five).						

Date
1.10.2018

Titular
Professor
Mircea-Florin Vaida, Ph.D.

Responsible
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