

230005 - FO - Fundamentals of Computers

Coordinating unit:	230 - ETSETB - Barcelona School of Telecommunications Engineering
Teaching unit:	701 - AC - Department of Computer Architecture
Academic year:	2019
Degree:	BACHELOR'S DEGREE IN TELECOMMUNICATIONS TECHNOLOGIES AND SERVICES ENGINEERING (Syllabus 2015). (Teaching unit Compulsory) BACHELOR'S DEGREE IN AUDIOVISUAL SYSTEMS ENGINEERING (Syllabus 2009). (Teaching unit Compulsory) BACHELOR'S DEGREE IN ELECTRONIC SYSTEMS ENGINEERING (Syllabus 2009). (Teaching unit Compulsory) BACHELOR'S DEGREE IN TELECOMMUNICATIONS SCIENCE AND TECHNOLOGY (Syllabus 2010). (Teaching unit Compulsory) BACHELOR'S DEGREE IN TELECOMMUNICATIONS SYSTEMS ENGINEERING (Syllabus 2010). (Teaching unit Compulsory) BACHELOR'S DEGREE IN NETWORK ENGINEERING (Syllabus 2010). (Teaching unit Compulsory)
ECTS credits:	6
Teaching languages:	Catalan, Spanish, English

Teaching staff

Coordinator:	Beatriz Otero Calviño
Others:	MANEL GUERRERO ZAPATA MARTA JIMENEZ CASTELLS ANTONIO JAVIER VALVERDE AMADOR FRANCISCO JORDAN BEATRIZ OTERO CALVIÑO SILVIA LLORENTE VIEJO MARIO MACÍAS LLORET TERESA MONREAL ARNAL Tous Liesa, Rubén Gil Gomez, Maria Luisa

Requirements

This course does not require having previously taken any other course.

Degree competences to which the subject contributes

Transversal:

1. TEAMWORK - Level 1. Working in a team and making positive contributions once the aims and group and individual responsibilities have been defined. Reaching joint decisions on the strategy to be followed.

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Teaching methodology

Practical classes
 Theory classes
 Laboratory classes
 Team work (no presential)
 Self study (no presential)
 Quizzes
 Final exam
 Laboratory practices
 Project

Learning objectives of the subject

The goals of this course are that:

1. The student must be able to code, test, and debug programs using the C language to solve elementary problems.
2. The student understands and masters the basics of procedural programming and uses the top-down design technique to solve the problems raised.
3. The student must understand what is about an operating system and its role on a computer functionality. He or She must know basic commands of a general purpose operating system.

Learning outcomes:

1. To Know the operation of a basic computer and how develop simple programs using it.
2. To use automatic tools for editing, compiling, running and debugging programs.
3. To correctly state the problem structure from a given problem description and identify alternative solutions.
4. To apply a suitable resolution choice and prove the correctness of that solution.
5. To know and correctly use the tools, instruments and applications, available at the lab, and properly achieve the analysis of the collected data.
6. To complete assigned tasks on a given schedule following the guidelines set by the course's profesor. The student must also be able to assess his or her work's progress, and the degree of fulfillment of this course's objectives.

Study load

Total learning time: 150h	Hours large group:	39h	26.00%
	Hours small group:	26h	17.33%
	Self study:	85h	56.67%

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Content

<p>Topic 1. Basic computer architecture</p>	<p>Learning time: 7h Theory classes: 3h Laboratory classes: 2h Self study : 2h</p>
<p>Description: Basic structure of a computer: memory, I/O and CPU. Description of the three subsystems. Representation of the information. Memory units. Process of implementation of a program.</p>	
<p>Topic 2. Basic programming concepts</p>	<p>Learning time: 25h 40m Theory classes: 12h Laboratory classes: 4h Self study : 9h 40m</p>
<p>Description: Basic terms: algorithms, programs, languages. Stages in the development of a program. Process of coding and testing of a program. Structure of a program. Constants, variables, expressions, statements. Elementary data types. Type conversion. Arithmetical, logical and relational operators. Priority of operators.</p>	
<p>Topic 3. Flow control statements</p>	<p>Learning time: 32h Theory classes: 12h Laboratory classes: 4h Self study : 16h</p>
<p>Description: Conditional sentences. Iterative sentences. Nesting of statements. Basic algorithms.</p>	
<p>Topic 4. Data structures</p>	<p>Learning time: 38h Theory classes: 12h Laboratory classes: 6h Self study : 20h</p>
<p>Description: Vectors. Matrices. Structs. Definition. Data using vectors, matrices and structs. Basic algorithms: Search, insertion and elimination.</p>	

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<p>Topic 5. Functions</p>	<p>Learning time: 40h 20m Theory classes: 16h Laboratory classes: 4h Self study : 20h 20m</p>
<p>Description: Definition and calls. Parameters (formal and real parameters, pass by value and by reference). Pointers. Input and output parameters. Top-Down methodology. Decomposition problems. Abstract type data.</p>	
<p>Topic 6. Files</p>	<p>Learning time: 7h Theory classes: 3h Laboratory classes: 2h Self study : 2h</p>
<p>Description: Management of files.</p>	

Qualification system

Laboratory (40%) = (30% - 50%) Quiz + (70% - 50%)Project
Quizzes theoretical (0% - 20%)
Final exam (40% - 60%)

Bibliography

Basic:

Jiménez, M.; Otero, B. Fundamentos de Ordenadores: programación en C [on line]. Barcelona: Iniciativa Digital Politècnica, 2013 [Consultation: 10/03/2015]. Available on: <<http://hdl.handle.net/2099.3/36593>>. ISBN 9788476539958.

Peña Basurto, M.A.; Cela Espín, J.M. Introducción a la programación en C [on line]. Barcelona: Edicions UPC, 2000 [Consultation: 04/03/2015]. Available on: <<http://hdl.handle.net/2099.3/36245>>. ISBN 8483014297.

Complementary:

Gottfried, B.S. Programación en C. 2a ed. rev. Madrid: McGraw-Hill, 2005. ISBN 8448198468.

Stallings, W. Organización y arquitectura de computadores. 7a ed. Madrid: Prentice Hall, 2006. ISBN 8489660824.