Course guide
230005 - FO - Fundamentals of Computers

Unit in charge: Barcelona School of Telecommunications Engineering
Teaching unit: 701 - DAC - Department of Computer Architecture.

Degree: BACHELOR'S DEGREE IN TELECOMMUNICATIONS TECHNOLOGIES AND SERVICES ENGINEERING (Syllabus 2015). (Compulsory subject).

Academic year: 2023    ECTS Credits: 6.0    Languages: Catalan, Spanish

LECTURER

Coordinating lecturer: Consultar aquí / See here: https://telecos.upc.edu/ca/estudis/curs-actual/professorat-responsables-coordinadors/responsables-assignatura

Others: Consultar aquí / See here: https://telecos.upc.edu/ca/estudis/curs-actual/professorat-responsables-coordinadors/professorat-assignat-idioma

PRIOR SKILLS

This course has no prerequisites.

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.

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

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self study</td>
<td>85,0</td>
<td>56.67</td>
</tr>
<tr>
<td>Hours large group</td>
<td>39,0</td>
<td>26.00</td>
</tr>
<tr>
<td>Hours small group</td>
<td>26,0</td>
<td>17.33</td>
</tr>
</tbody>
</table>

Total learning time: 150 h

CONTENTS

**Topic 1. Basic computer architecture**

**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.

**Full-or-part-time:** 7h
Theory classes: 3h
Laboratory classes: 2h
Self study: 2h
<table>
<thead>
<tr>
<th>Topic</th>
<th>Description</th>
<th>Full-or-part-time</th>
<th>Theory classes</th>
<th>Laboratory classes</th>
<th>Self study</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Basic programming concepts</td>
<td>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.</td>
<td>25h 40m</td>
<td>12h</td>
<td>4h</td>
<td>9h 40m</td>
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<td>3. Flow control statements</td>
<td>Conditional sentences. Iterative sentences. Nesting of statements. Basic algorithms.</td>
<td>32h</td>
<td>12h</td>
<td>4h</td>
<td>16h</td>
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<td>5. Functions</td>
<td>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.</td>
<td>40h 20m</td>
<td>16h</td>
<td>4h</td>
<td>20h 20m</td>
</tr>
<tr>
<td>6. Files</td>
<td>Management of files.</td>
<td>7h</td>
<td>3h</td>
<td>2h</td>
<td>2h</td>
</tr>
</tbody>
</table>
GRADING SYSTEM

Laboratory (40%) = (30% - 50%) Quizz + (70% - 50%) Project (Non-reevaluable act)
Quizzes theorical (0% - 20%)
Final exam (40% - 60%)

BIBLIOGRAPHY

Basic:

Complementary: