## 220040 - Real-Time Programming and Database Systems

<table>
<thead>
<tr>
<th>Coordinating unit:</th>
<th>205 - ESEIAAT - Terrassa School of Industrial, Aerospace and Audiovisual Engineering</th>
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</thead>
<tbody>
<tr>
<td>Teaching unit:</td>
<td>723 - CS - Department of Computer Science</td>
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<tr>
<td>Academic year:</td>
<td>2018</td>
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<tr>
<td>Degree:</td>
<td>BACHELOR'S DEGREE IN INDUSTRIAL ELECTRONICS AND AUTOMATIC CONTROL ENGINEERING (Syllabus 2009). (Teaching unit Optional)</td>
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<td>BACHELOR'S DEGREE IN MECHANICAL ENGINEERING (Syllabus 2009). (Teaching unit Optional)</td>
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<td>BACHELOR'S DEGREE IN CHEMICAL ENGINEERING (Syllabus 2009). (Teaching unit Optional)</td>
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<td>BACHELOR'S DEGREE IN AUDIOVISUAL SYSTEMS ENGINEERING (Syllabus 2009). (Teaching unit Optional)</td>
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<td>BACHELOR'S DEGREE IN TEXTILE TECHNOLOGY AND DESIGN ENGINEERING (Syllabus 2009). (Teaching unit Optional)</td>
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<td>BACHELOR'S DEGREE IN INDUSTRIAL DESIGN AND PRODUCT DEVELOPMENT ENGINEERING (Syllabus 2010). (Teaching unit Optional)</td>
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<td>BACHELOR'S DEGREE IN INDUSTRIAL TECHNOLOGY ENGINEERING (Syllabus 2010). (Teaching unit Optional)</td>
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<tr>
<td>ECTS credits:</td>
<td>3</td>
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<tr>
<td>Teaching languages:</td>
<td>English</td>
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### Teaching staff

**Coordinator:** Josefina López Herrera

### Prior skills

- Programming experience: c/c++

### Teaching methodology

Traditional lectures or distance learning.

Students will have to design in group a real-time control system.

Students will have to design and implement in group a case study.

### Learning objectives of the subject

**Module 1 - Real time algorithms design and implementation:** To be able to design both the software and hardware aspects of real-time systems specific concepts, design method, specific functions and algorithms of real-time operating systems, fault tolerance.

**Module 2 - Introduction to database systems:** The student should be able to:
- Construct an enhanced entity relationship model at a conceptual level
- Map the model into a relational database system
- Implement the given schema on a relational DBMS
- Use a database language for manipulating and querying the data
220040 - Real-Time Programming and Database Systems

Study load

<table>
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<tr>
<th>Total learning time: 75h</th>
<th>Hours large group:</th>
<th>30h</th>
<th>40.00%</th>
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<tr>
<td></td>
<td>Self study:</td>
<td>45h</td>
<td>60.00%</td>
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Content

**1. Module 1: Real time algorithms design and implementation**

**Learning time:** 53h
- Theory classes: 23h
- Self study: 30h

**Description:**
1.1 Introduction to real-time systems (Unified Modeling Language)
1.2 Software design and implementation methods for real-time systems
1.3 Real-time operating systems
1.4 Programming in C on C++
1.5 Fault tolerance

**Related activities:**
Traditional lectures or distance learning. Students will have to design in group a real-time control system.

**2. Module 2: Introduction to database system**

**Learning time:** 22h
- Theory classes: 7h
- Self study: 15h

**Description:**
2.1 Introduction
2.2 Database concepts
   - 2.2.1 Databases
   - 2.2.2 Specific purpose vs. resource databases
   - 2.2.3 Relational databases
     - One-to-one relationships
     - One-to-many relationships
     - Many-to-many relationships
     - Primary and foreign keys
     - Data types and definition
     - Look-up tables
     - Database applications

**Related activities:**
Traditional lectures or distance learning. Students will have to design and implement in group a case study.
Qualification system

Activities of practical classes, weight: 20 %
Module 1: evaluation, weight: 30 %
Module 2: evaluation, weight: 20 %
Project module 1 and Case Study module 2, weight: 30 %

Unsatisfying results of the final exam could be repeated in an exam to be carried out during the period of the final exams. Students with grades lower than 5 points (unsatisfactory) can retake the exam. The new grade, if it is equal or higher than 5 points, will substitute the original one with a grade of 5.

Regulations for carrying out activities

Bibliography

Basic:

Complementary: