220040 - Real-Time Programming and Database Systems

Coordinating unit: 205 - ESEIAAT - Terrassa School of Industrial, Aerospace and Audiovisual Engineering
Teaching unit: 723 - CS - Department of Computer Science
Academic year: 2017
Degree: BACHELOR’S DEGREE IN AEROSPACE VEHICLE ENGINEERING (Syllabus 2010). (Teaching unit Optional)
BACHELOR’S DEGREE IN INDUSTRIAL TECHNOLOGY ENGINEERING (Syllabus 2010). (Teaching unit Optional)
BACHELOR’S DEGREE IN AEROSPACE TECHNOLOGY ENGINEERING (Syllabus 2010). (Teaching unit Optional)
ECTS credits: 3
Teaching languages: Spanish

Teaching staff
Coordinator: Josefina López Herrera

Prior skills
programming experience: c/c++

Degree competences to which the subject contributes
Specific:
3. A basic understanding of the use and programming of computers, operating systems, databases and computer programs with applications in engineering

Transversal:
1. THIRD LANGUAGE. Learning a third language, preferably English, to a degree of oral and written fluency that fits in with the future needs of the graduates of each course.

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
## Study load

<table>
<thead>
<tr>
<th><strong>Total learning time:</strong> 75h</th>
<th>Hours large group:</th>
<th>30h</th>
<th>40.00%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Self study:</td>
<td>45h</td>
<td>60.00%</td>
</tr>
</tbody>
</table>
220040 - Real-Time Programming and Database Systems

<table>
<thead>
<tr>
<th>Content</th>
<th>Learning time: 53h</th>
</tr>
</thead>
</table>
| Module 1: Real time algorithms design and implementation | Theory classes: 23h  
Self study: 30h |

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

1.1 Introduction to real-time systems (Unified Modeling Language)

Degree competences to which the content contributes:

1.2 Software design and implementation methods for real-time systems

Degree competences to which the content contributes:

1.3 Real-time operating systems

Degree competences to which the content contributes:

1.4 Programming in C on C++

Degree competences to which the content contributes:

1.5 Fault tolerance

Degree competences to which the content contributes:

2. Module 2: Introduction to database system | Learning time: 22h |
|---------------------------------|--------------------|
| Related activities: | Theory classes: 7h  
Self study: 15h |

Traditional lectures or distance learning. Students will have to design and implement in group a case study.

2.1 Introduction

Degree competences to which the content contributes:
2.2 Database concepts

Degree competences to which the content contributes:

2.2.1 Databases

Degree competences to which the content contributes:

2.2.2 Specific purpose vs. resource databases

Degree competences to which the content contributes:

2.2.3 Relational databases

Degree competences to which the content contributes:

Description:
- 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

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 %

Regulations for carrying out activities

-
220040 - Real-Time Programming and Database Systems

Bibliography

Basic:


Complementary:
