820090 - PRE - Programming for Engineers

Coordinating unit: 295 - EEBE - Barcelona East School of Engineering
Teaching unit: 723 - CS - Department of Computer Science
Academic year: 2019

Degree:
BACHELOR'S DEGREE IN MATERIALS ENGINEERING (Syllabus 2010). (Teaching unit Optional)
BACHELOR'S DEGREE IN INDUSTRIAL ELECTRONICS AND AUTOMATIC CONTROL ENGINEERING (Syllabus 2009). (Teaching unit Optional)
BACHELOR'S DEGREE IN MECHANICAL ENGINEERING (Syllabus 2009). (Teaching unit Optional)
BACHELOR'S DEGREE IN BIOMEDICAL ENGINEERING (Syllabus 2009). (Teaching unit Optional)
BACHELOR'S DEGREE IN INDUSTRIAL ELECTRONICS AND AUTOMATIC CONTROL ENGINEERING (Syllabus 2009). (Teaching unit Optional)
BACHELOR'S DEGREE IN CHEMICAL ENGINEERING (Syllabus 2009). (Teaching unit Optional)
BACHELOR'S DEGREE IN ELECTRICAL ENGINEERING (Syllabus 2009). (Teaching unit Optional)
BACHELOR'S DEGREE IN ENERGY ENGINEERING (Syllabus 2009). (Teaching unit Optional)
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BACHELOR'S DEGREE IN CHEMICAL ENGINEERING (Syllabus 2009). (Teaching unit Optional)
BACHELOR'S DEGREE IN MECHANICAL ENGINEERING (Syllabus 2009). (Teaching unit Optional)
BACHELOR'S DEGREE IN ELECTRICAL ENGINEERING (Syllabus 2009). (Teaching unit Optional)

ECTS credits: 6
Teaching languages: Catalan, Spanish

Teaching staff
Coordinator: JAVIER FARRERES DE LA MORENA - FERRAN JUAN BARUEL
Others: Primer quadrimestre:
JAVIER FARRERES DE LA MORENA - T11, T12
FERRAN JUAN BARUEL - T11, T12

Prior skills
This is a second programming course. Preferrably it is desirable that the students have acquired already the basic programming habilities (done in Informática Q1).

Degree competences to which the subject contributes

Specific:
1. Understand the basics behind the use and programming of PCs, operating systems, databases and software with applications in engineering.

Transversal:
2. EFFECTIVE USE OF INFORMATION RESOURCES - Level 3. Planning and using the information necessary for an academic assignment (a final thesis, for example) based on a critical appraisal of the information resources used.

Teaching methodology
There are weekly one theory session and one practice session in computer laboratory. In parallel the students will propose and develop a project. Some practice sessions along the course will be devoted to the proposal. Collaborative learning. Project based learning (PBL).

Learning objectives of the subject
Learning objectives:
1. Analyzing complex problems by means of mechanisms or reduction to smaller problems.
2. Introducing the student to the use of abstract data types.
3. Introducing the student to Object Oriented Programming.
4. Introducing the student to Event Oriented Programming and development of applications with graphical interface (GUI)

Study load

<table>
<thead>
<tr>
<th>Total learning time: 150h</th>
<th>Hours large group: 30h</th>
<th>20.00%</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Hours medium group: 0h</td>
<td>0.00%</td>
</tr>
<tr>
<td></td>
<td>Hours small group: 30h</td>
<td>20.00%</td>
</tr>
<tr>
<td></td>
<td>Self study: 90h</td>
<td>60.00%</td>
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</table>
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## Content

<table>
<thead>
<tr>
<th><strong>Introduction</strong></th>
<th><strong>Learning time:</strong> 10h</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Theory classes: 2h</td>
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<tr>
<td></td>
<td>Laboratory classes: 4h</td>
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<tr>
<td></td>
<td>Self study : 4h</td>
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</tbody>
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**Description:**
Tasks and evaluation method is explained.

<table>
<thead>
<tr>
<th><strong>Analysis and life cicle</strong></th>
<th><strong>Learning time:</strong> 6h</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Theory classes: 2h</td>
</tr>
<tr>
<td></td>
<td>Self study : 4h</td>
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**Description:**
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<table>
<thead>
<tr>
<th><strong>Application design</strong></th>
<th><strong>Learning time:</strong> 36h</th>
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<tbody>
<tr>
<td></td>
<td>Theory classes: 14h</td>
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<tr>
<td></td>
<td>Laboratory classes: 2h</td>
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<tr>
<td></td>
<td>Self study : 20h</td>
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**Description:**
Diverse methodologies of application design are explained and practiced.

**Specific objectives:**
- Diseño descendente
- Diseño modular
- Diseño orientado a objetos
- Diseño modular

<table>
<thead>
<tr>
<th><strong>Abstract data types</strong></th>
<th><strong>Learning time:</strong> 6h</th>
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<tbody>
<tr>
<td></td>
<td>Theory classes: 2h</td>
</tr>
<tr>
<td></td>
<td>Self study : 4h</td>
</tr>
</tbody>
</table>

**Description:**
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Tasks and evaluation method is explained.

Diverse methodologies of application design are explained and practiced.

**Specific objectives:**
- Diseño descendente
- Diseño modular
- Diseño orientado a objetos
- Diseño modular
### Programming in graphic environment

<table>
<thead>
<tr>
<th>Learning time: 20h</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laboratory classes: 10h</td>
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<tr>
<td>Self study: 10h</td>
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</table>

**Description:**
Basic notions are explained need to program visual elements, and a project is developed.

### (ENG) Desarrollo

<table>
<thead>
<tr>
<th>Learning time: 64h</th>
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<tbody>
<tr>
<td>Theory classes: 10h</td>
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<tr>
<td>Laboratory classes: 10h</td>
</tr>
<tr>
<td>Self study: 44h</td>
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**Description:**

### Qualification system

The subject is valued in successive deliverables of a project the student develops along the course. The various deliverables and their weights are the following:

- Descendent Design(I) 5%
- Descendent Design(II) 15%
- Object Oriented Design 20%
- Portfolio Practice 20%
- Final Project 40%

### Regulations for carrying out activities

There is no final exam.
Bibliography

Basic: