**820090 - PRE - Programming for Engineers**

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**Coordinating unit:** 295 - EEBE - Barcelona East School of Engineering  
**Teaching unit:** 723 - CS - Department of Computer Science  
**Academic year:** 2018  
**Degree:**  
- BACHELOR'S DEGREE IN ELECTRICAL ENGINEERING (Syllabus 2009). (Teaching unit Optional)  
- BACHELOR'S DEGREE IN MECHANICAL ENGINEERING (Syllabus 2009). (Teaching unit Optional)  
- BACHELOR'S DEGREE IN CHEMICAL ENGINEERING (Syllabus 2009). (Teaching unit Optional)  
- BACHELOR'S DEGREE IN ENERGY ENGINEERING (Syllabus 2009). (Teaching unit Optional)  
- BACHELOR'S DEGREE IN ELECTRONICS AND AUTOMATIC CONTROL 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 BIOENGINEERING (Syllabus 2009). (Teaching unit Optional)  
- BACHELOR'S DEGREE IN MECHANICAL 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 MATERIALS ENGINEERING (Syllabus 2010). (Teaching unit Optional)

**ECTS credits:** 6  
**Teaching languages:** Catalan, Spanish

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**Teaching staff**

**Coordinator:** JAVIER FARRERES DE LA MORENA  
Juan Baruel, Ferran  

**Others:** JAVIER FARRERES DE LA MORENA - FERRAN JUAN BARUEL

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**Prior skills**

This is a second programming course. Preferably it is desirable that the students have acquired already the basic programming abilities (done in Informática Q1).

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**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.

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**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).

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**Learning objectives of the subject**

Learning objectives:
820090 - PRE - Programming for Engineers

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)

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

<table>
<thead>
<tr>
<th>Topic</th>
<th>Learning time</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td><strong>Introduction</strong></td>
<td>10h</td>
<td>Tasks and evaluation method is explained.</td>
</tr>
<tr>
<td><strong>Analysis and life cycle</strong></td>
<td>6h</td>
<td></td>
</tr>
<tr>
<td><strong>Application design</strong></td>
<td>36h</td>
<td>Diverse methodologies of application design are explained and practiced.</td>
</tr>
<tr>
<td><strong>Abstract data types</strong></td>
<td>6h</td>
<td></td>
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</tbody>
</table>

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

<table>
<thead>
<tr>
<th><strong>Description:</strong></th>
<th><strong>Learning time:</strong> 20h</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Laboratory classes: 10h</td>
</tr>
<tr>
<td></td>
<td>Self study: 10h</td>
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</tbody>
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**Description:**
Basic notions are explained need to program visual elements, and a project is developed.

### (ENG) Desarrollo

<table>
<thead>
<tr>
<th><strong>Description:</strong></th>
<th><strong>Learning time:</strong> 64h</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Theory classes: 10h</td>
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<tr>
<td></td>
<td>Laboratory classes: 10h</td>
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<tr>
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<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: