820015 - PE - Engineering Design

**Coordinating unit:** 295 - EEBE - Barcelona East School of Engineering

**Teaching unit:** 717 - EGE - Department of Engineering Presentation

**Academic year:** 2017

**Degree:**
- Bachelor's Degree in Biomedical Engineering (Syllabus 2009). (Teaching unit Compulsory)
- Bachelor's Degree in Electrical Engineering (Syllabus 2009). (Teaching unit Compulsory)
- Bachelor's Degree in Energy Engineering (Syllabus 2009). (Teaching unit Compulsory)
- Bachelor's Degree in Industrial Electronics and Automatic Control Engineering (Syllabus 2009). (Teaching unit Compulsory)
- Bachelor's Degree in Mechanical Engineering (Syllabus 2009). (Teaching unit Compulsory)
- Bachelor's Degree in Industrial Electronics and Automatic Control Engineering (Syllabus 2009). (Teaching unit Compulsory)
- Bachelor's Degree in Chemical Engineering (Syllabus 2009). (Teaching unit Compulsory)
- Bachelor's Degree in Biomedical Engineering (Syllabus 2009). (Teaching unit Compulsory)
- Bachelor's Degree in Energy Engineering (Syllabus 2009). (Teaching unit Compulsory)

**ECTS credits:** 6

**Teaching languages:** Catalan, Spanish, English

**Coordinator:** FRANCISCO ALPISTE PENALBA

**Others:**
- FRANCISCO ALPISTE PENALBA - ENRIC JOAN CODINA RIERA - JOSEP PARDINA RIBAS - JOSÉ LUIS RODRÍGUEZ ESPANTOSO - FRANCESC TENSA CASTELLA - ALBERTO MIGUEL GASENI DE LA TORRE - OSCAR HERNANDO RUPEREZ - JOEL FRAX CERVERA

**Teaching staff**

**Requirements**

We recommend have studied "Graphic Expression" and "Enterprise"

**Degree competences to which the subject contributes**

**Specific:**
1. Understand the organisational structure and functions of project management offices.

**Transversal:**
2. 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.
3. EFFECTIVE USE OF INFORMATION RESOURCES - Level 1. Identifying information needs. Using collections, premises and services that are available for designing and executing simple searches that are suited to the topic.
4. EFFICIENT ORAL AND WRITTEN COMMUNICATION - Level 1. Planning oral communication, answering questions properly and writing straightforward texts that are spelt correctly and are grammatically coherent.
5. SELF-DIRECTED LEARNING - Level 1. Completing set tasks within established deadlines. Working with recommended information sources according to the guidelines set by lecturers.
820015 - PE - Engineering Design

Teaching methodology

The course uses the methodology of lecture in 15%, individual work by 30%, work in groups by 15% and project-based learning by 40%.

Teaching methodology:

MD1. Participatory and expository class with theoretical and practical content
MD2. Active methodologies in the classroom (Project-Based Learning, PBL)
MD3. Practice of case studies resolution and exercises related to the contents of the subject with the participation of students
MD5. Student activities led by teacher
MD8. Teamwork
MD9. Self-work

Learning objectives of the subject

1. Using techniques and tools for managing engineering projects, including planning, development and implementation.
2. Knowing and applying specifications, regulations and standards.
3. Drafting texts with the appropriate structure to the communication objectives.
4. Introducing the text to an audience with the strategies and appropriate means.
5. Knowing and implementing the way and the dynamics of teamwork.
6. Identifying information needs and using collections, spaces and services available to design and implement suited searches to the topic.
7. Taking the work entrusted from the guidelines set by the teacher, deciding the time to be used in each section, including personal contributions and expanding the information sources indicated.
8. Taking initiatives that create opportunities with a vision of process implementation and market.
9. Applying sustainability criteria and professional codes of the profession.

Study load

<table>
<thead>
<tr>
<th>Total learning time: 150h</th>
<th>Hours large group: 30h</th>
<th>20.00%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hours medium group: 0h</td>
<td>0.00%</td>
</tr>
<tr>
<td></td>
<td>Hours small group: 15h</td>
<td>10.00%</td>
</tr>
<tr>
<td></td>
<td>Guided activities: 15h</td>
<td>10.00%</td>
</tr>
<tr>
<td></td>
<td>Self study: 90h</td>
<td>60.00%</td>
</tr>
</tbody>
</table>
## Content

<table>
<thead>
<tr>
<th>PMO. Project Management Office</th>
<th><strong>Learning time:</strong> 8h</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Theory classes: 4h</td>
</tr>
<tr>
<td></td>
<td>Self study : 4h</td>
</tr>
</tbody>
</table>

**Description:**
Understanding the functioning of technical office and engineering companies.

<table>
<thead>
<tr>
<th>Product Design</th>
<th><strong>Learning time:</strong> 12h</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Theory classes: 6h</td>
</tr>
<tr>
<td></td>
<td>Self study : 6h</td>
</tr>
</tbody>
</table>

**Description:**
Introducing product design that includes: the market (user needs), specifications for product design, conceptual design, detailed design, manufacturing and sales. Incorporating quality design tools.

<table>
<thead>
<tr>
<th>Project Development</th>
<th><strong>Learning time:</strong> 90h</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Practical classes: 15h</td>
</tr>
<tr>
<td></td>
<td>Guided activities: 15h</td>
</tr>
<tr>
<td></td>
<td>Self study : 60h</td>
</tr>
</tbody>
</table>

**Description:**
Application of the concepts of engineering projects to develop a project through the methodology PBLE (Project based learning engineering).

<table>
<thead>
<tr>
<th>Project Management</th>
<th><strong>Learning time:</strong> 16h</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Theory classes: 8h</td>
</tr>
<tr>
<td></td>
<td>Self study : 8h</td>
</tr>
</tbody>
</table>

**Description:**
Knowing the basics of project management.
### Viability

**Description:**
Studying technical and socioeconomic feasibility of the project submitted.

<table>
<thead>
<tr>
<th>Learning time: 16h</th>
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</thead>
<tbody>
<tr>
<td>Theory classes: 8h</td>
</tr>
<tr>
<td>Self study: 8h</td>
</tr>
</tbody>
</table>

### Design Engineer. Freelance engineer

**Description:**
Learning professional alternatives: working as freelance or hired in a technical office oriented to facilities or to product design.

<table>
<thead>
<tr>
<th>Learning time: 8h</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theory classes: 4h</td>
</tr>
<tr>
<td>Self study: 4h</td>
</tr>
</tbody>
</table>
### Planning of activities

| **PARTICIPATORY CLASS/ LECTURE** | **Hours:** 30h  
Theory classes: 15h  
Self study: 15h |
|---|---|
| **Description:**  
Mainly expository, but by engaging the student with short-term activities. The teacher is the protagonist, sets the task and sets the pace of activity.  
Hours: 2h/week  
In class (Big group): 1h  
Self study: 1h |

**Descriptions of the assignments due and their relation to the assessment:**  
Similar exercises to the examples solved by the teacher to be made by each student.

| **PROBLEM/ PROJECT-BASED LEARNING** | **Hours:** 90h  
Practical classes: 15h  
Self study: 60h  
Guided activities: 15h |
|---|---|
| **Description:**  
The method is based on the approach to problems by the teacher that the student must meet or developing a project at a time.  
Hours: 6h/week  
Practical classes (half group): 1h  
Guided study: 1h  
Self study: 4h |

**Descriptions of the assignments due and their relation to the assessment:**  
**PROJECT**  
**Specific objectives:**  
Developing a PROJECT, Workgroups

| **PRACTICE OF CASE STUDIES RESOLUTION AND EXERCISES** | **Hours:** 30h  
Theory classes: 15h  
Self study: 15h |
|---|---|
| **Description:**  
Practice of case studies resolution and exercises related to the contents of the subject with the participation of students.  
Hours: 2h/week  
In class (Big group): 1h  
Self study: 1h |
Descriptions of the assignments due and their relation to the assessment:

Similar exercises to the examples solved by the teacher to be made by each student.

Qualification system

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Percentage</th>
</tr>
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<tbody>
<tr>
<td>(EV1, EV4) Exams of project theory</td>
<td>25%</td>
</tr>
<tr>
<td>(EV1, EV4) Exams of problems</td>
<td>25%</td>
</tr>
<tr>
<td>(EV3) Deliverables</td>
<td>20%</td>
</tr>
<tr>
<td>(EV2) Project:</td>
<td>30%</td>
</tr>
</tbody>
</table>

EV1 Written or oral tests to monitor individual knowledge
EV2 Evaluation of practical work by delivering reports (project)
EV3 Attendance and participation in theoretical and practical sessions. Delivering exercises and problems
EV4 Evaluation of individual work

The final evaluation includes the generic competence tested in the subject: CT4. Teamwork. This Teamwork mark constitutes the 20% of the project qualification. It's calculated by the contributions made by each student in the development of the project from the professor assessment and the other students point of view.

Projectes d'Enginyeria (Engineering design) has not RE-EVALUATION exam.

Constraints
It is necessary to pass the course the delivery of a project developed specifically as an activity of the subject.

Regulations for carrying out activities

Exam of theory without consulting learning materials
Exam of problems consulting learning materials
Bibliography

Complementary:


Others resources:

Learning material published in the virtual learning environment.

Hyperlink

ATENEA

http://atenea.upc.edu/moodle/