Course guides
820015 - PE - Engineering Design

Unit in charge: Barcelona East School of Engineering
Teaching unit: 717 - DEGD - Department of Engineering Graphics and Design.

Degree:
BACHELOR’S DEGREE IN INDUSTRIAL ELECTRONICS AND AUTOMATIC CONTROL ENGINEERING (Syllabus 2009). (Compulsory subject).
BACHELOR’S DEGREE IN ELECTRICAL ENGINEERING (Syllabus 2009). (Compulsory subject).
BACHELOR’S DEGREE IN MECHANICAL ENGINEERING (Syllabus 2009). (Compulsory subject).
BACHELOR’S DEGREE IN CHEMICAL ENGINEERING (Syllabus 2009). (Compulsory subject).
BACHELOR’S DEGREE IN BIOMEDICAL ENGINEERING (Syllabus 2009). (Compulsory subject).
BACHELOR’S DEGREE IN ENERGY ENGINEERING (Syllabus 2009). (Compulsory subject).

Academic year: 2020 ECTS Credits: 6.0 Languages: Catalan, English, Spanish

LECTURER

Coordinating lecturer: FRANCISCO ALPISTE PENALBA

Others:
Primer quadrimestre:
FRANCISCO ALPISTE PENALBA - M31, M32
JOEL FRAX CERVERA - T21
ALBERT LÓPEZ PUIGBÓ - M21, M22
CARLOS MARTINEZ TOMAS - T11
JOSE MONTERO LOPEZ - M11, M12

Segon quadrimestre:
FRANCISCO ALPISTE PENALBA - M11, M12
CARLOS MARTINEZ TOMAS - T21, T22
MARC PALOM AGUSTÍ - T11, T12
JAVIER RODRIGUEZ GALDEANO - M21, M22

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.
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>Type</th>
<th>Hours</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours large group</td>
<td>30,0</td>
<td>20.00</td>
</tr>
<tr>
<td>Guided activities</td>
<td>15,0</td>
<td>10.00</td>
</tr>
<tr>
<td>Hours small group</td>
<td>15,0</td>
<td>10.00</td>
</tr>
<tr>
<td>Self study</td>
<td>90,0</td>
<td>60.00</td>
</tr>
</tbody>
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Total learning time: 150 h

CONTENTS

PMO. Project Management Office

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

Related competencies:
CEI-18. Understand the organisational structure and functions of project management offices.

Full-or-part-time: 8h
Theory classes: 4h
Self study: 4h
### Product Design

**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

**Related competencies:**
CEI-18. Understand the organisational structure and functions of project management offices.

**Full-or-part-time:** 12h  
Theory classes: 6h  
Self study: 6h

### Project Development

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

**Related competencies:**
CEI-18. Understand the organisational structure and functions of project management offices.  
07 AAT N1. SELF-DIRECTED LEARNING - Level 1. Completing set tasks within established deadlines. Working with recommended information sources according to the guidelines set by lecturers.  
05 TEQ N1. 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.  
06 URI N1. 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.  
04 COE N1. 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.

**Full-or-part-time:** 90h  
Practical classes: 15h  
Guided activities: 15h  
Self study: 60h

### Project Management

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

**Related competencies:**
CEI-18. Understand the organisational structure and functions of project management offices.

**Full-or-part-time:** 16h  
Theory classes: 8h  
Self study: 8h
### Viability

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

**Related competencies:**
CEI-18. Understand the organisational structure and functions of project management offices.

**Full-or-part-time:** 16h
- Theory classes: 8h
- Self study: 8h

### Design Engineer. Freelance engineer

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

**Related competencies:**
CEI-18. Understand the organisational structure and functions of project management offices.

**Full-or-part-time:** 8h
- Theory classes: 4h
- Self study: 4h

### ACTIVITIES

#### PARTICIPATORY CLASS/ LECTURE

**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

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

**Related competencies:**
CEI-18. Understand the organisational structure and functions of project management offices.

**Full-or-part-time:** 30h
- Theory classes: 15h
- Self study: 15h
PROBLEM/PROJECT-BASED LEARNING

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

Specific objectives:
Developing a PROJECT, Workgroups

Delivery:
PROJECT

Related competencies:
CEI-18. Understand the organisational structure and functions of project management offices.
07 AAT N1. SELF-DIRECTED LEARNING - Level 1. Completing set tasks within established deadlines. Working with recommended information sources according to the guidelines set by lecturers.
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Full-or-part-time: 90h
Practical classes: 15h
Guided activities: 15h
Self study: 60h

PRACTICE OF CASE STUDIES RESOLUTION AND EXERCISES

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

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

Related competencies:
CEI-18. Understand the organisational structure and functions of project management offices.
04 COE N1. 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.
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05 TEQ N1. 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.

Full-or-part-time: 30h
Theory classes: 15h
Self study: 15h
GRADING SYSTEM

(EV1, EV4) Exams of project theory 25%
(EV1, EV4) Exams of problems 25%
(EV3) Deliverables 20%
(EV2) Project: 30%

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.

EXAMINATION RULES.

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

BIBLIOGRAPHY

Complementary:

RESOURCES

Hyperlink:
- ATENEA. http://atenea.upc.edu/moodle/

Other resources:
Learning material published in the virtual learning environment.