

## 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 ELECTRICAL ENGINEERING (Syllabus 2009). (Teaching unit Compulsory)  
BACHELOR'S DEGREE IN MECHANICAL 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)  
BACHELOR'S DEGREE IN INDUSTRIAL ELECTRONICS AND AUTOMATIC CONTROL ENGINEERING (Syllabus 2009). (Teaching unit Compulsory)  
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 CHEMICAL ENGINEERING (Syllabus 2009). (Teaching unit Compulsory)

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

### Teaching staff

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

### 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.

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### 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

Total learning time: 150h	Hours large group:	30h	20.00%
	Hours medium group:	0h	0.00%
	Hours small group:	15h	10.00%
	Guided activities:	15h	10.00%
	Self study:	90h	60.00%

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### Content

<p>PMO. Project Management Office</p>	<p>Learning time: 8h Theory classes: 4h Self study : 4h</p>
<p>Description: Understanding the functioning of technical office and engineering companies.</p>	
<p>Product Design</p>	<p>Learning time: 12h Theory classes: 6h Self study : 6h</p>
<p>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</p>	
<p>Project Development</p>	<p>Learning time: 90h Practical classes: 15h Guided activities: 15h Self study : 60h</p>
<p>Description: Application of the concepts of engineering projects to develop a project through the methodology PBLE (Project based learning engineering).</p>	
<p>Project Management</p>	<p>Learning time: 16h Theory classes: 8h Self study : 8h</p>
<p>Description: Knowing the basics of project management.</p>	

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Viability	Learning time: 16h Theory classes: 8h Self study : 8h
Description: Studying technical and socioeconomic feasibility of the project submitted.	
Design Engineer. Freelance engineer	Learning time: 8h Theory classes: 4h Self study : 4h
Description: Learning professional alternatives: working as freelance or hired in a technical office oriented to facilities or to product design.	

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### Planning of activities

<p><b>PARTICIPATORY CLASS/ LECTURE</b></p>	<p>Hours: 30h Theory classes: 15h Self study: 15h</p>
<p>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.</p> <p>Hours: 2h/week In class (Big group): 1h Self study: 1h</p> <p>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.</p>	
<p><b>PROBLEM/PROJECT-BASED LEARNING</b></p>	<p>Hours: 90h Practical classes: 15h Self study: 60h Guided activities: 15h</p>
<p>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.</p> <p>Hours: 6h/week Practical classes (half group): 1h Guided study: 1h Self study: 4h</p> <p>Descriptions of the assignments due and their relation to the assessment: PROJECT</p> <p>Specific objectives: Developing a PROJECT, Workgroups</p>	
<p><b>PRACTICE OF CASE STUDIES RESOLUTION AND EXERCISES</b></p>	<p>Hours: 30h Self study: 15h Theory classes: 15h</p>
<p>Description: Practice of case studies resolution and exercises related to the contents of the subject with the participation of students.</p> <p>Hours: 2h/week In class (Big group): 1h Self study: 1h</p>	

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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

(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.

### Regulations for carrying out activities

Exam of theory without consulting learning materials

Exam of problems consulting learning materials

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### Bibliography

#### Complementary:

Brusola Simon, Fernando. Oficina técnica y proyectos. Valencia: Universidad Politécnica de Valencia, 1999. ISBN 9788477217831.

Santos Sabrás, Fernando. Ingeniería de proyectos. 2ª ed. Pamplona: Eunsa, 2002. ISBN 9788431317232.

Companyns Pascual, Ramón; Corominas Subías, Albert. Planificación y rentabilidad de proyectos industriales. Planificación y rentabilidad de proyectos industriales. Barcelona: Marcombo Boixerau Editores, 1988. ISBN 8426707173.

Nicolás, Pere. Elaboración y control de presupuestos. Barcelona: Ediciones Gestión 2000, SA, 2007. ISBN 9788480883436.

Pahl, Gerhard ... [et al.]. Engineering Design [on line]. 3th ed. London: Springer London, 2007 [Consultation: 06/10/2016]. Available on: <<http://dx.doi.org/10.1007/978-1-84628-319-2>>. ISBN 978-1-84628-319-2.

Pugh, Stuart. Total design : integrated methods for successful product engineering. Wokingham, England [etc.]: Addison-Wesley Pub. Co., cop. 1990. ISBN 0201416395.

Romero López, Carlos. Técnicas de programación y control de proyectos. Madrid: Piramide, 1997. ISBN 9788436811513.

Stevenson, Susan; Whitmore, Steve. Strategies for engineering communication. New York [etc.]: John Wiley & Sons, cop. 2002. ISBN 0471128171.

Zaidi, A. QFD : despliegue de la función de calidad. Madrid: Díaz de Santos, 1993. ISBN 8479780606.

A Guide to the project management body of knowledge (PMBOK® Guide) [on line]. 4th ed. Newtown Square, Pa.: Project Management Institute, cop. 2008 [Consultation: 06/10/2016]. Available on: <<http://site.ebrary.com/lib/upcatalunya/docDetail.action?docID=10461923>>. ISBN 9781933890517.

#### Others resources:

Learning material published in the virtual learning environment.

#### Hyperlink

ATENEA

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