



Course guide

240071 - 240071 - Project Management

Last modified: 16/05/2023

Unit in charge: Barcelona School of Industrial Engineering
Teaching unit: 758 - EPC - Department of Project and Construction Engineering.

Degree: BACHELOR'S DEGREE IN INDUSTRIAL TECHNOLOGY ENGINEERING (Syllabus 2010). (Compulsory subject).
BACHELOR'S DEGREE IN AUTOMOTIVE ENGINEERING (Syllabus 2017). (Optional subject).

Academic year: 2023 **ECTS Credits:** 6.0 **Languages:** Catalan, Spanish, English

LECTURER

Coordinating lecturer: Lázaro V. Cremades Oliver

Others:

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:

8. Knowledge and capacities to organise and manage projects. Knowing the organisational structure and functions of a project office.

Generical:

4. PROJECT MANAGEMENT: Being able to present, execute and direct Industrial Engineering projects, by means of applying scientific and technologic knowledge , attitudes and procedures, once conditions have been identified or valued.

Transversal:

1. SELF-DIRECTED LEARNING. Detecting gaps in one's knowledge and overcoming them through critical self-appraisal. Choosing the best path for broadening one's knowledge.
2. EFFICIENT ORAL AND WRITTEN COMMUNICATION. Communicating verbally and in writing about learning outcomes, thought-building and decision-making. Taking part in debates about issues related to the own field of specialization.
3. ENTREPRENEURSHIP AND INNOVATION: Knowing about and understanding how businesses are run and the sciences that govern their activity. Having the ability to understand labor laws and how planning, industrial and marketing strategies, quality and profits relate to each other.
5. SUSTAINABILITY AND SOCIAL COMMITMENT. Being aware of and understanding the complexity of social and economic phenomena that characterize the welfare society. Having the ability to relate welfare to globalization and sustainability. Being able to make a balanced use of techniques, technology, the economy and sustainability.
6. TEAMWORK. Being able to work as a team player, either as a member or as a leader. Contributing to projects pragmatically and responsibly, by reaching commitments in accordance to the resources that are available.
7. EFFECTIVE USE OF INFORMATION RESOURCES. Managing the acquisition, structure, analysis and display of information from the own field of specialization. Taking a critical stance with regard to the results obtained.

TEACHING METHODOLOGY

1. CLASSROOM TUITION

In-person tuition at classroom combines theoretical with practical training. Students have to perform in groups of 4-6 people a project during the quarter (from the Proposal to the Preliminar Study / Draft Project) and have to deliver a series of reports (exercises) related to this project. At the end of the semester, they have to make a public presentation and a poster.

The evaluation will be ongoing. The exercises will take place outside school hours. In the practical sessions, the progress of the project will be monitored and the exercises performed will be discussed.

Each of the lessons includes:

- (i) A theoretical exposition by the professor illustrated with examples
- (ii) Implementation of the concepts and techniques by students
- (iii) Monitoring by the teacher of the ongoing work
- (iv) Oral presentation of the results of work done in teams (in the cases of the Project Proposal and the chosen solution).

2. OUT-CLASSROOM STUDENT ACTIVITY. Cooperative learning

This is a highly practical course that promotes teamwork in a collaborative way, with the goal of learning to raise and choose the best solution for a project.

The out-classroom activity includes: Developing common work (deliverables). Defining the problem to be studied, information search and analysis, development of the subject, getting results, writing documents and presentation.

LEARNING OBJECTIVES OF THE SUBJECT

Main goal:

Students should be able to propose, implement and manage engineering projects, through the application of scientific and technical knowledge (concepts and principles), attitudes and procedures, once the constraints are identified and assessed.

Specific objectives:

Acquire a basic knowledge of:

- the project activity,
- the key points of the methodology and project management,
- the functional specifications of the results that will serve as a framework for further extensions of the project topic, for example, in the Final Degree Project.

STUDY LOAD

Type	Hours	Percentage
Self study	90,0	60.00
Hours medium group	60,0	40.00

Total learning time: 150 h

CONTENTS

1. THE PROJECT AND ITS STAGES

Description:

- The project concept.
- Project methodology and project types.
- The repetitive project and the unique project or R&D.
- Morphology of the project. Stages of rational making. Classical stages of the project. Matrix project activities.
- The project life cycle.
- Creative stages of the project:
 - Order of magnitude.
 - Preliminary study or feasibility study.
 - Preliminary stage or basic design.
 - Project stage or detailed design.
- Construction stage and project management.

Specific objectives:

- Distinguish the different types of projects.
- Knowing the different stages of the project and see the need to work in stages.
- Define the objective of the project, differentiating the aim, purpose and scope of the project.

Related activities:

Open questions in classroom. Divide students into small groups and assign a project subject to each subgroup.

Full-or-part-time: 9h

Theory classes: 4h

Laboratory classes: 2h

Self study : 3h

2. PROBLEM DEFINITION AND ANALYSIS OF NEEDS

Description:

- Project approach. Objectives.
- Variables, constraints and evaluation criteria.
- Machines and people: Definition and characteristics of person-artifact-system environment.
- User types and their different needs for their position in the project.
- Identification of the needs of users. Maslow's pyramid.
- The user "operator" of a system. Physical environment and human performance.
- The welfare ergonomic conditions.
- Technical specifications.
- Search for information. Sources of information.

Specific objectives:

- Identify the solution variables of the problem, constraints and evaluation criteria, in order to apply it to the project to be conducted in groups.
- Understand the importance of the application of ergonomics as a source of comfort and safety.
- Being able to see the user as the reason for a product.
- Be able to assess the level of satisfaction that gives the project the user.
- Dominate the search for specific information on databases, journals, legislation, textbooks...
- Information management. Index cards. Ability to select the information.

Related activities:

Work and monitoring in the classroom on the assigned project.

Full-or-part-time: 9h

Theory classes: 4h

Laboratory classes: 2h

Self study : 3h



3. TECHNICAL DESIGN AND ANALYSIS OF ALTERNATIVES

Description:

- The design process in engineering.
- Creativity techniques. Conceptual design. Brainstorming.
- Functional Analysis. Abstraction in general and specific functions.
- Value Analysis. Analysis of the functions of a product. Evaluation functions by the user. Cost associated by function. Analysis of the value of each function.
- Preliminary design and detail. Design for X. Economic design. Robust design.
- Technological reliability, human reliability, risk, uncertainty and related concepts.
- Safety in design: stupid-proof design.
- Methods of evaluation of projects.

Specific objectives:

- Distinguish the difference between need, idea and purpose
- Building and using functional trees
- Knowing the types of existing designs
- Learn the concepts of risk and reliability

Related activities:

Work and monitoring in the classroom on the assigned project.

Full-or-part-time: 9h

Theory classes: 4h

Laboratory classes: 2h

Self study : 3h

4. ECONOMIC AND ENVIRONMENTAL FEASIBILITIES AND TECHNICAL REGULATIONS

Description:

- Technical, economic, environmental and social feasibilities of a project.
- The capital investment budget. Cost estimation methods.
- The operating cost budget.
- Study of profitability.
- Sensitivity analysis and uncertainty.
- Entrepreneurial activity.
- Concept of sustainable development.
- Pollution prevention in the project phase. Environmental Impact Assessment (EIA).
- Legal protection. Standards and industrial legislation.
- intellectual property.

Specific objectives:

- Be able to make an economic evaluation from both qualitative and quantitative points of view.
- Know the different types of business cases and be able to decide whether a project will be economically feasible or not.
- Apply the concept of sustainable development in projects.
- Know the environmental legislation and existing laws and know how to apply.
- Knowing about and manage patent information.

Related activities:

Work and monitoring in the classroom on the assigned project.

Full-or-part-time: 10h

Theory classes: 4h

Laboratory classes: 3h

Self study : 3h



5. PROJECT MANAGEMENT

Description:

- Definitions and need for project management.
- Quality-cost-term relationship.
- Organization, planning, scheduling and project control.
- Project size and organization:
 - Establish and review dates and durations.
 - Determination of critical and noncritical activities.
 - Determination of the critical path.
 - Definition and characteristics of different programming means.
- Using graphs or networks
- Project monitoring during implementation phase
- Control reports.
- The human factor in projects. Human resources. The project manager.

Specific objectives:

- Understand and distinguish the different organizational schemes.
- Be able to represent a project using different types of diagrams.
- Be able to propose corrective actions for project control.
- Know the qualities to be a good manager or a good negotiator.
- Be able to improve the scope of the project analyzing the desires of customers.

Related activities:

Work and monitoring in the classroom on the assigned project.

Full-or-part-time: 12h

Theory classes: 5h

Laboratory classes: 4h

Self study : 3h

6. COMMUNICATION IN PROJECTS

Description:

- Importance of and planning the communication in projects.
- Types of projects. Public utility projects. Private initiative projects. Final Degree Project.
- Project documents and content in relation to the stages of the project.
- Classical documentation: Memory, Plans, Specifications and Budget.
- Oral and written communication skills.
- Multiculturalism and new technologies.

Specific objectives:

- Understand and distinguish the different types of documents that form a project
- Improve oral and written communication of student
- Be able to write the project report we have been working throughout the course

Related activities:

Open questions in classroom.

Full-or-part-time: 7h

Theory classes: 3h

Laboratory classes: 1h

Self study : 3h

GRADING SYSTEM

The final grade for each student will consist of a weighted sum of the following four marks:

- NI : Exercises-reports + Poster (30%). In general, this mark will be common for the subgroup, with exceptions according to the professor.
- NPO : Oral presentation (20%). Individual mark.
- NE : Written exam (35%). Individual mark.
- NV : Personal rating (attitude, interest in the subject, classroom interventions, timeliness of delivery, attendance, etc.) (15%). Individual mark.

$$NT = 0.3 NI + 0.2 NPO + 0.35 NE + 0.15 NV +/- c$$

where "c" is an increment resulting from grade normalization.

When assessing the work, the following criteria will be taken into account:

- Goodness of results (30%)
- Level of compliance, as set out in the statement (20%)
- Effort involved, due to the difficulty or complexity of the work (25%)
- Performance obtained (number of attempts...) (25%)

The final grade will be decided after a joint meeting of all the professors at the end of the semester, in order to standardize the grades between all Groups.

Students that did not pass at the end of the course and opt for a reexamination, the written exam mark will replace the final exam. The final grade will be calculated using the same formula above by adding the corrective adjustment for normalization of grades:

$$NT = 0.3 NI + 0.2 NPO + 0.35 NER + 0.15 NV +/- c$$

- . NER : Written reexamination exam (minimum grade for averaging: 3.5)
- . c : Corrective adjustment for normalization of grades

EXAMINATION RULES.

There will be NO mid-term exam.

The final exam will last a maximum of two hours. During the exam, it will not be allowed to consult any material.

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Basic:

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Complementary:

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