

Course guide

320018 - MOP - Project Oriented Methodology

Last modified: 11/04/2025

Unit in charge: Terrassa School of Industrial, Aerospace and Audiovisual Engineering
Teaching unit: 758 - EPC - Department of Project and Construction Engineering.

Degree: BACHELOR'S DEGREE IN CHEMICAL ENGINEERING (Syllabus 2009). (Compulsory subject).
BACHELOR'S DEGREE IN ELECTRICAL ENGINEERING (Syllabus 2009). (Compulsory subject).
BACHELOR'S DEGREE IN INDUSTRIAL ELECTRONICS AND AUTOMATIC CONTROL ENGINEERING (Syllabus 2009). (Compulsory subject).
BACHELOR'S DEGREE IN MECHANICAL ENGINEERING (Syllabus 2009). (Compulsory subject).
BACHELOR'S DEGREE IN TEXTILE TECHNOLOGY AND DESIGN ENGINEERING (Syllabus 2009). (Compulsory subject).
BACHELOR'S DEGREE IN INDUSTRIAL DESIGN AND PRODUCT DEVELOPMENT ENGINEERING (Syllabus 2010). (Compulsory subject).

Academic year: 2025 **ECTS Credits:** 6.0 **Languages:** Catalan

LECTURER

Coordinating lecturer: Macarulla Martí, Marcel
Pardo Bosch, Francesc

Others: Almirall Arriero, Elisabet
Amorós Casahuga, Elisabet
López Carreño, Rubén Daniel
Palacios Higuera, Jose Ignacio
Pros Farran, Marçal
Cebolla Alemany, Joaquim
Saiz Segarra, Miguel Angel

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:

CED29-DIDP. Knowledge of technical document writing and presentation. (Common module to the industrial branch)
CED30-DIDP. Knowledge of project methodology, organization and management. (Common module to the industrial branch)
CED31-DIDP. Knowledge of regulations, legislation, and project management procedures. (Common module for the industrial branch)
CED32-DIDP. Knowledge of aesthetics. (Specific technology module: industrial design)
CED63-DIDP. Ability to draft, develop, and direct a comprehensive engineering project in the field of industrial design and product development. (Common module in the industrial branch)
CED64-DIDP. Ability to handle specifications, regulations, technical standards, and the necessary legislation for the profession's development. (Common module in the industrial branch)
CE18-INDUS. Knowledge and skills to organize and manage projects. Understand the organizational structure and functions of a project office. (Common module in the industrial branch)

Transversal:

CT02 N3. Sustainability and social commitment - Level 3. Taking social, economic and environmental factors into account in the application of solutions. Undertaking projects that tie in with human development and sustainability.
CT05 N3. 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.

TEACHING METHODOLOGY

The lecturing methodology will consist of:

- Face-to-face sessions of presentation of the contents
- Face-to-face sessions of practical work (exercises and problems)
- Work in collaborative groups
- Autonomous work for the realization of the project
- Autonomous work

This subject may have some groups with classes in Catalan and Spanish. Check the schedule to see the language of instruction for each theory and problem group.

LEARNING OBJECTIVES OF THE SUBJECT

Provide students with necessary theoretical and practical knowledge because they will be able to realize any project in the engineering area.

Student should acquire knowledge and capacity of using necessary tools for: definition of the project, management of a project, evaluation of alternatives and take decisions about viability, environmental aspects, with technical, economic, and social viability. It will be remarked the information management, documentation, and cooperative work in the projects.

Students should obtain the following fundamental objectives:

- To understand basic concepts of a project,
- To apply work methodologies that are necessary for the deployment of projects (project management).
- To promote the creativity of the student.
- To analyse problems of the realization of projects.
- To analyse alternatives to solve problems.
- To evaluate adopted solutions and work realised in the development of the project.
- To develop basic engineering of the proposed solution.

STUDY LOAD

Type	Hours	Percentage
Hours large group	15,0	10.00
Self study	90,0	60.00
Hours small group	45,0	30.00

Total learning time: 150 h

CONTENTS

Module 1: Project in engineering

Description:

1.1 The Engineering Project. Methodology for problem solving: Concept of engineering project. The design process. Basic concepts (Basic specifications. Scope of the Project. Object of the Project. Justification of the Project). Phases of the Project. Project life cycle.

1.2 The Engineering Project. Individual and group work: Complexity of projects. Multidisciplinary/Hierarchy. The different roles of project actors. Advantages and conditions of group work. Formal project documents. Work models and formats.

1.3 The BSCW: collaborative tool for group work: How it works. Organization of documents. Work on BSCW. Registration and access to the BSCW

Related activities:

Activity 1: Large/theory group sessions

Activity 2: Exercises theory sessions

Activity 3: Case study of designing the project

Full-or-part-time: 18h

Theory classes: 2h

Laboratory classes: 6h

Self study : 10h

Module 2: Analysis and synthesis in project

Description:

2.1 Analysis and functional design of projects: Project as a system. Decomposable system in subsystems, components and parts. The functional analysis tool. The functional design tool.

2.2 Project design variables: The design variables tool for defining the project. Input, output and solution variables. Evaluation criteria and restrictions.

2.3 Project evaluation techniques: Need to select. Alternative evaluation methods.

2.4 Information and presentation of results: Need for information. Information sources and types of information. Organization of information. The market study tool. The usefulness and myth of regulations and manuals. Effective presentations.

Related activities:

Activity 1: Large/theory group sessions

Activity 2: Exercises theory sessions

Activity 3: Case study of designing the project

Full-or-part-time: 36h

Theory classes: 4h

Laboratory classes: 12h

Self study : 20h

Module 3: Planning and programming of projects

Description:

3.1 Concept and implications of planning and programming: Identification of activities. Work breakdown structure (EDP or WBS). Priorities. Importance of time in the project. Relationship between cost and time. Programming. Basic programming concepts. Gantt. PERT. Precedence diagrams.

3.2 Programming with computer media: The Microsoft-Project program. General options. Calculation options. The project calendar. The to-do list. Task creation. The estimated duration. The task link. Link type. Task options. The allocation of resources. Resource calendar. Calculation of the programmed duration. Resource conflicts. The dedication of resources. Leveling.

3.3 Resource optimization: Resource allocation. Identification of programming conflicts. Resolution of resource conflicts. Identification of resource conflicts. Resolution of resource conflicts. Leveling

3.4 Project control: Program control. Time control. Updating of programming. Integration of the methodology in the development of the project.

Related activities:

Activity 1: Large/theory group sessions
Activity 2: Exercises theory sessions
Activity 3: Case study of designing the project

Full-or-part-time: 29h

Theory classes: 3h
Laboratory classes: 11h
Self study : 15h

Module 4: Estimation of costs and economic evaluation of projects

Description:

4.1 Estimation of investment capital: Definition of investment costs. Direct and indirect costs. Methods for estimating investment capital based on the phases of the project.

4.2 Estimation of operating costs: Definition of production costs. Fixed and variable costs.

4.3 Economic feasibility of the projects: Benefit-cost ratio. Pay Back. Breakeven point. Economic evaluation of projects. Net present value. Internal rate of return. Cash Flow.

Related activities:

Activity 1: Large/theory group sessions
Activity 2: Exercises theory sessions
Activity 3: Case study of designing the project

Full-or-part-time: 27h

Theory classes: 3h
Laboratory classes: 9h
Self study : 15h

Module 5: Project phases and basic document

Description:

5.1 Preliminary study: Purpose. Contents. Stages to be carried out. Market analysis. Determination of the location. Content of the feasibility study.

5.2 Basic Engineering: Purpose. Contents. Stages to be carried out. Basic engineering content.

5.3 Development phases: Detailed engineering, purchasing management, project supervision and execution, commissioning.

5.4 Basic documents of the project: Report. Blueprints. Budget. Specifications.

Related activities:

Activity 1: Large/theory group sessions

Activity 2: Exercises theory sessions

Activity 3: Case study of designing the project

Activity 4: Final theory exam

Activity 5: Project Evaluation. Oral presentation

Full-or-part-time: 40h

Theory classes: 3h

Laboratory classes: 7h

Self study : 30h

ACTIVITIES

ACTIVITY 1: THEORY SESSIONS

Description:

Pre and post preparation of the theory sessions and attendance at them.

Specific objectives:

Transfer the necessary knowledge for a correct interpretation of the contents developed in the large group sessions, resolution of doubts in relation to the subject matter and development of generic competences.

Material:

Notes of the subject on the Athena platform.

General bibliography of the subject.

Delivery:

There is not

Full-or-part-time: 11h

Self study: 6h

Theory classes: 5h

ACTIVITY 2: THEORETICAL EXERCISES

Description:

Development of exercises and activities related to the concepts presented in the theoretical sessions. It also includes the completion of a final activity to validate theoretical concepts.

Specific objectives:

Acquire the skills for a correct interpretation of the concepts of the subject, as well as a satisfactory application of the tools and instruments developed in theory sessions.

Development of generic competences.

Delivery:

During these sessions, the teachers and the students would develop theoretical and/or practical exercises, face-to-face in class, individually or in small groups.

It represents 35% of the final grade for the course.

Full-or-part-time: 15h

Self study: 6h

Theory classes: 9h

ACTIVITY 3: PRACTIC CASE OF PROJECT

Description:

Development of the basic engineering of a proposed project by the tutor assigned to each group, applying the concepts and methodologies presented in the theory sessions.

Specific objectives:

Acquire the skills for a correct interpretation of the concepts of the subject, as well as a satisfactory application of the tools and instruments developed in theory sessions.

Development of generic competences.

Material:

Notes of the subject on the Athena platform.

Work guidelines published in Athena.

Support material for the preparation of documents and presentations.

General bibliography of the subject.

Delivery:

Agenda for each small group session. The delivery of these documents will take place 24 hours before each session to the small group.

Minutes of the group meeting. The delivery of these documents will take place after each session to the small group.

Initial Report (Project Charter). These documents will be delivered in digital format. The delivery date will be set the first week of class.

Preliminary draft. These documents will be delivered in digital format. The delivery date will be set the first week of class.

Final project documents: Report, Plan, Specifications and Budget + Project Poster. These documents will be delivered in digital format. The delivery date will be during the week of completion of the face-to-face classes.

It represents 55% of the final grade for the subject, and corresponds to two parts of the evaluation of the developed project:

- Project evaluation: project documents = 25%
- Project evaluation: individual work to achieve the objectives of the project = 30%

Full-or-part-time: 102h

Self study: 67h

Laboratory classes: 35h

ACTIVITY 5: EVALUATION PROJECT. ORAL PRESENTATION

Description:

Oral presentation of the developed project.

Specific objectives:

Check the student's ability to present their results in public. Synthesis capacity.
Development of generic competences.

Material:

Audiovisual tools to make the presentation.

Delivery:

Final presentation in digital format.
It represents 10% of the final grade for the course.

Full-or-part-time: 22h

Self study: 11h

Theory classes: 1h

Laboratory classes: 10h

GRADING SYSTEM

The final mark of the course will be obtained from the following marks with the weighting indicated:

Theory sessions activities 35%

Project evaluation. Project documents 25%

Project evaluation. Oral Presentation 10%

Project evaluation. Individual work 30%

One of the parameters with which the students will be evaluated in the laboratories is their participation during the weekly follow-up sessions, and in this sense the laboratories are considered evaluation acts. Therefore, the unexcused absence in any laboratory session will cause the student to receive the final grade of NOT PRESENTED. The final oral presentation session of the project is also considered as an evaluation act, and therefore in this case the grade will also be NOT PRESENTED.

The note of the exercises of the theory sessions is obtained based on activities or works developed in these sessions related to the theoretical concepts that are being introduced, and its replacement by alternative activities cannot be requested.

In the evaluation of the project documents, both content and formal aspects will be considered.



EXAMINATION RULES.

Practical case of project

Students will be organised in groups. Cooperative group is the way to work with group. Coordinator will be chosen by the rest members of group.

Each group should realize an official document which explains work to do in the next session. They also write a diary act which explains what subjects have been arguing and what are the agreements adopted.

The student presence in laboratory session is considered an act evaluation. Assistance in these sessions is obligated for all students and it is needed for passing the course. Students should sign an assistance list at the beginning of the laboratory session.

Contents and documents of the development of the project will be defined in the first week of course. All these documents will have to be available in the corresponding folder of a virtual platform. Only the documents hanged to the platform will be considered for evaluation. The course will not accept any work which is given out of the deadlines fixed for delivery. If any group do not present the project, they will receive a qualification as NOT PRESENTED.

Evaluation of the Project. Oral presentation

Each group should present their project at the last week of course during 20-25 minutes. Students can use computer media in the presentation (PowerPoint, etc.).

Professors of the department will evaluate oral presentation. Students will be asked to answer some questions which teacher will consider appropriate. Professors will evaluate presentation with: structure, clarity, dynamics, answer to the questions and media used, etc.

BIBLIOGRAPHY

Basic:

- Piquer Chanzá, José S. El proyecto en ingeniería y arquitectura. 3ª ed. Barcelona: CEAC, 1990. ISBN 8432920061.
- Heredia Scasso, R. de. Arquitectura y urbanismo industrial: diseño y construcción de plantas, edificios y polígonos industriales. 2ª ed. Madrid: ETSII, 1981. ISBN 8474840171.
- Gómez-Senent, Eliseo. Las fases del proyecto y su metodología. Valencia: Universidad Politècnica de Valencia, 1992. ISBN 8477211809.

RESOURCES

Other resources:

Notes made by the professors of the department.
Industrial regulations.