

Course guide

330071 - MGOP - Project Methodology, Management and Orientation

Last modified: 26/05/2025

Unit in charge: Manresa School of Engineering

Teaching unit: 750 - EMIT - Department of Mining, Industrial and ICT 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 CHEMICAL ENGINEERING (Syllabus 2016). (Compulsory subject).
BACHELOR'S DEGREE IN INDUSTRIAL ELECTRONICS AND AUTOMATIC CONTROL ENGINEERING (Syllabus 2016). (Compulsory subject).
BACHELOR'S DEGREE IN MECHANICAL ENGINEERING (Syllabus 2016). (Compulsory subject).
BACHELOR'S DEGREE IN AUTOMOTIVE ENGINEERING (Syllabus 2017). (Optional subject).

Academic year: 2025

ECTS Credits: 6.0

Languages: Catalan, Spanish

LECTURER

Coordinating lecturer: Yubero De Mateo, María Teresa

Others: Prat Cornet, Joan Jaume
Planells Torres, Mariano

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:

1. (ENG) Conèixer l'estructura organitzativa i les funcions d'una oficina de projectes.
2. (ENG) Coneixements de redacció i presentació de documents tècnics.
3. (ENG) Coneixements de metodologia, organització i gestió de projectes.
4. (ENG) Coneixements de normativa, legislació i tramitació de projectes.
5. (ENG) Capacitat per a realitzar projectes de productes, màquines, mecanismes i instal·lacions industrials.
6. (ENG) Coneixement de les eines de disseny per a aplicar-les en projectes de disseny i redisseny de productes.
7. (ENG) Coneixements de la metodologia de disseny.
8. (ENG) Capacitat pràctica de redisseny de projectes.
9. (ENG) Coneixements pràctics de metodologia de disseny industrial.
10. (ENG) Capacitat per a redactar, desenvolupar i dirigir un projecte integral d'enginyeria en l'àmbit industrial.
11. (ENG) Capacitat pel maneig d'especificacions, reglaments, normes tècniques i la legislació necessària per al desenvolupament de la professió.

Transversal:

12. SELF-DIRECTED LEARNING - Level 3. Applying the knowledge gained in completing a task according to its relevance and importance. Deciding how to carry out a task, the amount of time to be devoted to it and the most suitable information sources.
13. EFFICIENT ORAL AND WRITTEN COMMUNICATION - Level 3. Communicating clearly and efficiently in oral and written presentations. Adapting to audiences and communication aims by using suitable strategies and means.
14. ENTREPRENEURSHIP AND INNOVATION - Level 3. Using knowledge and strategic skills to set up and manage projects. Applying systemic solutions to complex problems. Devising and managing innovation in organizations.
15. 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.
16. TEAMWORK - Level 3. Managing and making work groups effective. Resolving possible conflicts, valuing working with others, assessing the effectiveness of a team and presenting the final results.
17. 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.
18. GENDER PERSPECTIVE: An awareness and understanding of sexual and gender inequalities in society in relation to the field of the degree, and the incorporation of different needs and preferences due to sex and gender when designing solutions and solving problems.

TEACHING METHODOLOGY

LEARNING OBJECTIVES OF THE SUBJECT

STUDY LOAD

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

Total learning time: 150 h

CONTENTS

(ENG) TEORIA DE PROJECTES

(ENG) GESTIÓ DE PROJECTES

(ENG) PRÀCTIQUES DE LABORATORI

(ENG) TEMA 1: L'enginyer: Atribucions i competències. Sortides professionals.

Description:

Analysis of the engineer's professional profile. Legal attributions and competences. Fields of action and career opportunities in engineering. Relationship between academic training and professional practice.

Group debate on the current role of engineers in society.

Development of a professional pathway map by engineering field.

Gender perspective in engineering: historical inequality, current barriers and inclusion strategies.

Sustainability as a cross-cutting value in engineering: environmental, social and economic approach to projects.

Análisis de casos de ingenieros en diferentes sectores.

Case studies on engineers working in different sectors.

Full-or-part-time: 6h

Theory classes: 4h

Laboratory classes: 1h

Guided activities: 1h

(ENG) TEMA 2: Informe tècnic i valoració. Característiques.

Description:

Introduction to the technical report as an essential engineering document. Types of reports. Structure, writing style, and assessment criteria. Basic formatting and evaluation regulations.

Full-or-part-time: 1h

Theory classes: 1h

(ENG) TEMA 3: Concepte de projecte. Estructuració en fases: estudi previ, avantprojecte i projecte. Agents del projecte.

Description:

Definition of a project. Differences between preliminary study, draft project, and final design. Project stakeholders: promoter, manager, technical staff, etc.

Visual mapping of the phases of a real project.

Group work to identify project stakeholders and their responsibilities.

Presentation of a real project highlighting each phase.

Full-or-part-time: 1h

Theory classes: 1h

(ENG) TEMA 4: Morfologia de Projecte. Tipus de projecte i finalitats.

Description:

Study of the formal structure of engineering projects. Analysis of the main components: report, drawings, specifications, budget, and annexes. Classification of projects by purpose (construction, installation, service, product, research, etc.). Adapting the format to project type and applicable regulations.

Full-or-part-time: 1h

Theory classes: 1h

(ENG) TEMA 5: Memòria: Justificació del projecte i annexes a desenvolupar.

Description:

Preparation and content of the project report: objectives, technical and economic justification, state of the art, applicable regulations, and proposed solutions. Technical annexes, calculation reports, and supporting documentation. Consistency between the report and other project components.

Full-or-part-time: 1h

Theory classes: 1h

(ENG) TEMA 6: Plànols: Característiques, classificació i ordenació. Plànols segons projecte.

Description:

Types and roles of drawings in technical projects. Standard graphic representation rules and symbols. Classification (site plans, floor plans, sections, details, installations, diagrams, etc.). Organization and hierarchy of drawings. Common formats and CAD systems.

Full-or-part-time: 1h

Theory classes: 1h

(ENG) TEMA 7: Execució del projecte: Fases i característiques de cadascuna.

Description:

Phases of project development and execution: planning, technical implementation, quality control, validation, and commissioning. Schedule monitoring, resource management, and risk control. Team coordination and client communication.

Full-or-part-time: 1h

Theory classes: 1h

(ENG) TEMA 8: Pressupost i amidaments: Quadres de preus, pressupost parcial i general.

Description:

Project budget structure: work units, measurements, price tables, partial and total budget. Estimation of direct and indirect costs. Pricing sources and databases. Importance of the budget as a management and control tool.

Full-or-part-time: 1h

Theory classes: 1h

(ENG) TEMA 9: Plec de condicions: Disposicions generals, plec de condicions tècniques, facultatives, econòmiques i legals. Aspectes: Contractació d'obres i serveis.

Description:

Function of the specifications document in a project. General clauses and technical, economic, and legal sections. Contractual regulations, quality requirements, execution conditions, and applicable laws. Key aspects of construction and service contracting.

Full-or-part-time: 1h

Theory classes: 1h

(ENG) TEMA 10: Principals reglaments que afecten als projectes: Seguretat i salut, urbanístics, baixa tensió, protecció contra incendis, activitats (medi ambient).

Description:

Essential regulations for technical projects: occupational health and safety, urban planning regulations, low voltage regulations, fire protection standards, and environmental legislation. Identification, application, and integration into the project design.

Full-or-part-time: 1h

Theory classes: 1h

(ENG) TEMA 11: Projectes d'activitat: Característiques i condicionants.

Description:

Specific characteristics of activity projects: purpose, legalization, and administrative processing. Technical, regulatory, and environmental constraints. Activities requiring authorization, notification, or license. Coordination with public authorities.

Full-or-part-time: 1h

Theory classes: 1h

title english

Description:

content english

Full-or-part-time: 1h

Theory classes: 1h

ACTIVITIES

(ENG) PRÀCTICA 1: REALITZACIÓ D'INFORME TÈCNIC A PARTIR DE DADES REALS.

Description:

Review and correction of a real technical report.
Writing a basic technical report on a practical case.
Self-assessment and peer review.

Full-or-part-time: 3h

Self study: 1h

Laboratory classes: 2h

(ENG) PRÀCTICA 2: REALITZACIÓ DE VALORACIÓ ECONÒMICA.

Description:

Calculation of direct and indirect costs.
Preparing cost tables and budgets using Excel.
Simulating different economic scenarios.

Full-or-part-time: 8h

Self study: 4h

Laboratory classes: 4h

(ENG) PRÀCTICA 3: CERCA DE REGLAMENTS I NORMATIVES LEGALS PER A LA REALITZACIÓ DE PROJECTES D'ENGINYERIA A ESPANYA I EUROPA.

Description:

Research on technical and environmental regulations.
Classification of regulations by field of application.
Writing a justified summary report.

Full-or-part-time: 6h

Self study: 2h

Laboratory classes: 4h

(ENG) PRÀCTICA 4: CONFECCIÓ DE DOCUMENTACIÓ VISUAL (PLÀNOLS).

Description:

Drawing plans using SolidWorks or LibreCAD.
Creating floor plans, elevations and detail drawings.
Including title block, scales, and standard symbols.

Full-or-part-time: 8h

Self study: 4h

Laboratory classes: 4h

(ENG) PRÀCTICA 5: IMPLEMENTACIÓ DE MEMÒRIA DE PROJECTE BÀSIC.

Description:

Drafting the project's technical report.
Including tables, images and regulatory references.
Integrating annexes developed in other practices.

Full-or-part-time: 6h

Self study: 4h

Laboratory classes: 2h

(ENG) PRÀCTICA 6: ELABORACIÓ D'AMIDAMENTS, QUADRES DE PREUS I PRESSUPOSTOS.

Description:

Measurement of technical or construction elements.
Calculation of work items using Excel measurements.
Preparing partial and general budgets.

Full-or-part-time: 9h

Self study: 5h

Laboratory classes: 4h

(ENG) PRÀCTICA 7: PLANIFICACIÓ I ELABORACIÓ DEL PROJECTE.

Description:

Defining project phases and duration assignments.
Creating a PERT diagram in Excel.
Optionally, using ProjectLibre for scheduling.

Full-or-part-time: 9h

Self study: 3h

Laboratory classes: 6h

(ENG) PRÀCTICA 8: RECERCA D'INFORMACIÓ DE PLEC DE CONDICIONS.

Description:

Searching real examples of project specifications.
Writing a simplified technical specification.
Organizing sections: general, technical, economic and legal.

Full-or-part-time: 9h

Self study: 5h

Laboratory classes: 4h

(ENG) PRÀCTICA 9: DOCUMENTACIÓ ANNEXA: ESTUDI DE SEGURETAT I SALUT.

Description:

Identifying project risks.
Drafting a basic health and safety study.
Drawing a risk signage plan.

Full-or-part-time: 6h

Self study: 5h

Laboratory classes: 1h

(ENG) PRÀCTICA 10: DOCUMENTACIÓ ANNEXA: ESTUDI DE VIABILITAT ECONÒMICA DEL PROJECTE.

Description:

Analysis of costs and revenues.
Feasibility study and payback time (Excel).
Graphical representation of breakeven point.

Full-or-part-time: 6h

Self study: 4h

Laboratory classes: 2h

(ENG) PRÀCTICA 11: EXPOSICIÓ ORAL DEL PROJECTE REALITZAT.

Description:

Preparing an oral presentation with visual support.
Role distribution within the group.
Evaluation according to presentation rubric.

Full-or-part-time: 20h

Self study: 16h

Laboratory classes: 4h



GRADING SYSTEM

BIBLIOGRAPHY

Basic:

- Código técnico de la edificación y sus reformas [CD-ROM] [on line]. Pamplona: DAPP, 2011 [Consultation: 18/06/2024]. Available on: <https://www.codigotecnico.org/>. ISBN 9788492507320.
- Reglamento de seguridad contra incendios en los establecimientos industriales RSCIEI (Real Decreto 2267/2004, de 3 de diciembre) y guía técnica de aplicación (octubre 2007). Madrid: Paraninfo, 2008. ISBN 9788428330299.
- Heredia, R. de. Arquitectura y urbanismo industrial: diseño y construcción de plantas, edificios y polígonos industriales. 2ª ed. Madrid: Escuela Técnica Superior de Ingenieros Industriales, 1981. ISBN 8474840171.
- Piquer, J. S. El proyecto de ingeniería y arquitectura: estudio, planificación, desarrollo. Barcelona: CEAC, 1983. ISBN 8432920061.
- Figuera, J. Técnicas modernas de planificación, programación y control de proyectos: PERT-CPM. Madrid: SAETA, 1964.
- Goldenberg, J.; Mazursky, D. Creativity in product innovation [on line]. Cambridge: Cambridge University Press, 2002 [Consultation: 23/11/2021]. Available on: <https://doi.org/10.1017/CBO9780511674464>. ISBN 0521002494.
- Kerzner, Harold. Project management: a systems approach to planning, scheduling and controlling [on line]. 11th ed. Hoboken: John Wiley & Sons, 2013 [Consultation: 27/05/2022]. Available on: <https://ebookcentral-proquest-com.recursos.biblioteca.upc.edu/lib/upcatalunya-ebooks/detail.action?docID=1113482>. ISBN 9781118022276.

Complementary:

- Hodson, W. K., ed. Maynard: manual del ingeniero industrial. México: McGraw Hill, 1996. ISBN 9701010574.
- Henry, J. G.; Heinke, G. W. Ingeniería ambiental. México: Prentice-Hall, 1999. ISBN 9701702662.