

Course guide

340061 - TFGR-M8R40 - Bachelor's Thesis

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Unit in charge: Vilanova i la Geltrú School of Engineering
Teaching unit: 340 - EPSEVG - Vilanova i la Geltrú School of Engineering.
Degree: BACHELOR'S DEGREE IN MECHANICAL ENGINEERING (Syllabus 2009). (Project subject).
Academic year: 2026 **ECTS Credits:** 24.0 **Languages:** Catalan, Spanish, English

LECTURER

Coordinating lecturer:

Others:

PRIOR SKILLS

It is advisable to have passed all the mandatory courses in the curriculum.

REQUIREMENTS

The TFG will generally be carried out in the last term of the degree. The student may enroll in the last term, provided that he/she complies with UPC regulations. Registration of the TFG is an essential requirement to formalize the enrollment.

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Transversal:

01 EIN N1. ENTREPRENEURSHIP AND INNOVATION - Level 1. Showing enterprise, acquiring basic knowledge about organizations and becoming familiar with the tools and techniques for generating ideas and managing organizations that make it possible to solve known problems and create opportunities.

01 EIN N2. ENTREPRENEURSHIP AND INNOVATION - Level 2. Taking initiatives that give rise to opportunities and to new products and solutions, doing so with a vision of process implementation and market understanding, and involving others in projects that have to be carried out.

01 EIN N3. 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.

02 SCS N1. SUSTAINABILITY AND SOCIAL COMMITMENT - Level 1. Analyzing the world's situation critically and systemically, while taking an interdisciplinary approach to sustainability and adhering to the principles of sustainable human development. Recognizing the social and environmental implications of a particular professional activity.

02 SCS N2. SUSTAINABILITY AND SOCIAL COMMITMENT - Level 2. Applying sustainability criteria and professional codes of conduct in the design and assessment of technological solutions.

02 SCS 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.

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.

04 COE N2. EFFICIENT ORAL AND WRITTEN COMMUNICATION - Level 2. Using strategies for preparing and giving oral presentations. Writing texts and documents whose content is coherent, well structured and free of spelling and grammatical errors.

04 COE N3. 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.

07 AAT. 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.

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.

06 URI N2. EFFECTIVE USE OF INFORMATION RESOURCES - Level 2. Designing and executing a good strategy for advanced searches using specialized information resources, once the various parts of an academic document have been identified and bibliographical references provided. Choosing suitable information based on its relevance and quality.

06 URI 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.

06 URI. 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.

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.

07 AAT N2. SELF-DIRECTED LEARNING - Level 2: Completing set tasks based on the guidelines set by lecturers. Devoting the time needed to complete each task, including personal contributions and expanding on the recommended information sources.

07 AAT N3. 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.

04 COE. 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.

TEACHING METHODOLOGY

The student will carry out the Final Degree Project (TFG) through a methodology based on autonomous and directed learning, with the continuous support of the director. This methodology includes:

- 1- Personalized tutorials: Follow-up sessions (face-to-face or online) with the director to guide the development of the work, resolve doubts and evaluate progress.
- 2- Bibliographic search and review: Reading and critical analysis of specialized bibliography, scientific articles and documentary sources relevant to the project.
- 3- Autonomous work: Individual planning and execution of the TFG, with autonomy in time management, information search and application of acquired knowledge.
- 4- Project development: Writing, analysis and elaboration of contents, with methodology adapted to the specific objectives of the work.
- 5- Defense and communication: Preparation of the oral and written presentation of the TFG before the tribunal, following the established academic criteria.

This methodology guarantees that the student integrates the competences acquired during the degree, applying them in a professional or research project, with a tutored follow-up by an engineer.

LEARNING OBJECTIVES OF THE SUBJECT

The purpose of the TFG course is for the student to develop and demonstrate the following objectives and competences:

1. Engineering Project Management
Plan, develop and execute technical projects applying methodologies and tools specific to the field of study.
Manage resources, deadlines and project phases following quality standards.
2. Application of Regulations and Technical Specifications
Interpret and apply regulations, norms and specifications specific to industrial engineering.
Integrate legal and technical documents in the development of the project.
3. Effective Technical Communication
Elaborate academic and technical documents with logical structure, methodological rigor and adapted to the target audience.
Present and defend the work orally in front of a court, using appropriate strategies and visual supports.
4. Research and information management
Identify reliable sources and apply specialized research techniques in the field of mechanical engineering.
Analyze and synthesize technical and scientific information in a critical way.
5. Autonomous and Proactive Learning
Organize time and resources to carry out the project with autonomy.
Incorporate own contributions and expand the initial guidelines through additional research.
6. Innovation and Strategic Vision
Propose innovative solutions with a technical and market feasibility perspective.
Evaluate the economic, social and environmental impact of technical decisions.
7. Sustainability and Professional Responsibility
Integrate sustainability and efficiency criteria in project design.
Assess the social and environmental impact of the engineering solution

STUDY LOAD

Type	Hours	Percentage
Self study	590,0	98.33
Hours large group	10,0	1.67

Total learning time: 600 h

CONTENTS

Mechanical Engineering Project

Description:

Phases and concept of preliminary draft, project and feasibility

Full-or-part-time: 55h

Guided activities: 25h

Self study : 30h

Technical documentation

Description:

Identify information needs and use collections, spaces and services to design and execute searches suitable for the thematic area.

Full-or-part-time: 55h

Guided activities: 25h

Self study : 30h

Project Management

Description:

Perform work based on basic guidelines, deciding time to devote to each section, including personal contributions and expanding information sources. To assess the economic cost of the different tasks that include work.

Full-or-part-time: 55h

Guided activities: 25h

Self study : 30h

Environmental and health and safety aspects of the project

Description:

Ability to analyse and assess the social, ethic and environmental impact.

Full-or-part-time: 55h

Guided activities: 25h

Self study : 30h

Communication on projects

Description:

Compose texts with the structure appropriate to the communication objectives.

Full-or-part-time: 125h

Guided activities: 25h

Self study : 100h

Normalization and regulation

Description:

To know and apply specifications, regulations and rules.

Full-or-part-time: 45h

Guided activities: 15h

Self study : 30h

Contribution of a final career job as an integrating or synthesis exercise

Description:

Performing a project in the field of the specific technologies of mechanical engineering of a professional nature in the to summarise and integrate the skills acquired during the course of the studies.

Full-or-part-time: 100h

Self study : 100h

Preparing Evaluable Activities

Description:

Preparing the presentation of texts and other material for the public exposure of the work done, taking into account the approach suitable strategies and means.

Full-or-part-time: 106h

Self study : 106h

TFG Defense

Description:

Preparations and public defense before the assigned university court.

Full-or-part-time: 4h

Guided activities: 4h



GRADING SYSTEM

The evaluation of the TFG will consider the following aspects:

- Written project:

Strict compliance with the EPSEVG TFG editing standards.

Academic quality and methodological rigor

Clear and coherent structure of the content

- Public presentation before a panel of judges:

Demonstrated mastery of the field of study

Ability to synthesize and communicate effectively

Adequate use of visual supports and didactic resources.

- Oral defense:

Solid argumentation of the key aspects of the work.

Ability to respond to the questions posed

Fluency and professionalism in the presentation

Additional elements valued:

- Originality and contributions of the paper

- Time management during the presentation

- Correct use of technical language

EXAMINATION RULES.

In order to defend the work before the assigned tribunal, it will be necessary the final revision and authorization by the director of the final report. The work must be presented according to the standardization established by the Escuela Politécnica Superior de Ingeniería de Vilanova y la Geltrú (EPSEVG). For this purpose, the student will find all the information and templates in the TFG section of the School's website (<https://www.epsevg.upc.edu/ca/curs-actual/tfe>).

RESOURCES

Other resources:

Rumb TFE is a library support service for TFG or TFM students of the EPSEVG that consists in the achievement of a training itinerary adaptable to the needs of each participant. Link: <https://apps.bibliotechnica.upc.edu/informacions/BEPSEVG/S819/index.php>