Academic year
2026/2027

# Course Guide:
# FINAL DEGREE PROJECT
## (DEGREE IN CHEMICAL ENGINEERING)

FACULTY OF
CHEMICAL SCIENCES

# 1. IDENTIFICATION

| | | | | | |
|---|---|---|---|---|---|
| Degree Programme | Bachelor's Degree in Chemical Engineering. | | | Course Code | 801567 |
| Course Name | Final Degree Project | | | ECTS | 15 |
| Subject Area | Final Degree Project | | | | |
| Module | Final Degree Project | | | | |
| Course Type | Compulsory | Year | Fourth Year | Semester | Annual |
| Department | Chemical and Materials Engineering | | | | |

## Academic Staff and Assessment Panel

Assessment Panel 1

| Member | Email | Office |
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# 2. OBJECTIVES

## General objective

The Final Degree Project (FDP) is a design project for one or more units of an industrial plant. It is carried out individually by each student under the supervision of no more than two academic tutors, and its purpose is to demonstrate that the student has acquired the competences associated with the degree.

# 3. PREREQUISITES AND RECOMMENDATIONS

## Prerequisites

The FDP shall be registered as a course unit within the Degree curriculum. In general, to register for the TFG, students must have applied for registration in the TFG and have passed the Basic Module and 120 compulsory ECTS credits of the Bachelor's Degree in Chemical Engineering.

## Recommendations

Students are advised to have passed all first-, second- and third-year courses of the Degree before defending the FDP.

# 4. CONTENTS

## Brief description

In the FDP, students will apply the knowledge acquired throughout their degree studies to the design of one or more units of a plant corresponding to a process carried out at industrial or pilot-plant scale.

This work will take the form of a written report, accompanied by any material deemed appropriate, and its public defence before an Assessment Panel.

# 5. COMPETENCES

## General competences

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|---|---|
| CG1 | Use concepts from basic and technological subjects that enable autonomous learning of new methods and theories and the ability to address new situations. |
| CG2 | Draft and develop projects in the field of chemical engineering. |
| CG3 | Execute and direct the activities covered by projects in the field of chemical engineering. |
| CG4 | Solve problems in the field of chemical engineering with initiative, decision-making ability, and critical reasoning. |
| CG5 | Perform calculations, measurements, valuations, expert assessments, studies, and reports in the relevant field of knowledge. |
| CG6 | Use standards and regulations related to the relevant field of knowledge. |
| CG7 | Analyse and assess the social and environmental impact of the technical solutions identified for a given problem. |

## Specific competences (depending on the work to be carried out)

| | |
|---|---|
| CE1 | Solve mathematical problems that may arise in engineering. Apply knowledge of linear algebra, geometry, differential geometry, differential and integral calculus, ordinary and partial differential equations, numerical methods, numerical algorithms, statistics and optimisation. |
| CE3 | Use computer programs and operating systems. Use databases and software applications.<br>Use databases and computer applications |
| CE4 | Apply basic concepts of chemistry to engineering. |
| CE5 | Apply techniques of representation, spatial conception, standardisation, computer-aided design and fundamentals of industrial design. |
| CE7 | Apply concepts of applied thermodynamics and heat transfer. |
| CE8 | Use the basic principles of fluid mechanics. |
| CE9 | Apply the fundamentals of materials science. |
| CE10 | Apply the principles of circuit theory and electrical machines. |
| CE11 | Apply the fundamentals of electronics. |
| CE12 | Use the fundamentals of automation systems and control methods. |
| CE13 | Use the principles of machines and mechanisms. |
| CE14 | Apply the principles of strength of materials. |
| CE16 | Apply environmental technologies and sustainability. |
| CE19 | Solve material and energy balances. |
| CE20 | Apply concepts of biotechnology, mass transfer, separation operations, and chemical reaction engineering. Design reactors and evaluate the transformation of raw materials and energy resources. |
| CE21 | Analyse, design, simulate and optimise processes and products. |
| CE22 | Design and manage applied experimentation procedures, especially for the determination of thermodynamic and transport properties and for the modeling of phenomena and systems in the field of chemical engineering, systems involving fluid flow, heat transfer, mass-transfer operations, chemical reaction kinetics, and reactors. |
| CE23 | Design, manage, simulate, and control chemical-process instrumentation. |
| CE24 | Apply chemical and biochemical knowledge of analysis and synthesis to Chemical Engineering. |
| CE25 | Interpret data from laboratory observations and measurements in terms of their significance and the theories that support them. |

### Cross-cutting competences

| | |
|---|---|
| CT1 | Demonstrate capacity for analysis and synthesis. |
| CT2 | Demonstrate problem-solving ability. |
| CT3 | Demonstrate organisational and planning ability. |
| CT4 | Communicate in Spanish using standard audiovisual media. |
| CT5 | Properly manage the available information (bibliography, specialised databases and resources accessible through the Internet). |
| CT6 | Use computer tools and programs. |
| CT8 | Demonstrate capacity for critical and self-critical reasoning. |
| CT9 | Demonstrate a professional ethical commitment. |
| CT10 | Integrate acquired knowledge and apply it to solving real problems. |
| CT11 | Learn autonomously. |
| CT13 | Adapt to new situations and demonstrate initiative and creativity. |
| CT14 | Communicate in English using standard audiovisual media. |

## 6. WORKLOAD DISTRIBUTION BY ACTIVITY.

| Activity | In-class (hours) | Self-study (hours) | Credits |
|---|---|---|---|
| Design project work | 0 | 355 | 14,2 |
| Tutorials | 8 | 2 | 0,4 |
| Preparation and presentation for the public defence | 2 | 8 | 0,4 |
| **Total** | **10** | **365** | **15** |

## 7. METHODOLOGY

The FDP will be carried out individually by each student under the supervision of one or two academic tutors, whose role is to guide and supervise the student's work, provide suggestions and help the student overcome any obstacles and difficulties. The student remains solely responsible for successfully completing the course unit.

The student will carry out the design tasks required to achieve the objectives of the project. This work will materialise in a written report, accompanied by any material deemed appropriate, and in its oral presentation and public defence before an Assessment Panel. The report will include:

- Introduction and objectives
- Feasibility study
- Technical report
- Environmental impact assessment
- Safety
- Budget
- Bibliography

In all cases, a summary in English of each part of the TFG must be included, with a maximum length of 3-4 pages. The maximum length of the report is 100 pages, including appendices and drawings.

The student must meet with their academic tutor at least three times during the academic year to agree on the different TFG submissions. The final submission of the report to the tutor must be made at least one week before submission to the Assessment Panel. The tutor will approve the work if it meets the formal aspects and the minimum requirements specified in the regulations for its presentation. The student must sign the Declaration of Responsibility on Authorship and Ethical Use of AI Tools, available on the website of the Faculty of Chemical Sciences.

The UCM and Faculty regulations for this course unit, including its organisation and teaching planning, are published on the website of the Faculty of Chemical Sciences: https://quimicas.ucm.es/tfg.

The aforementioned regulations for this course unit are also published on the website of the Department of Chemical and Materials Engineering, together with the general rules on the writing and presentation format of the report, the functions of the tutor, authorship and all the documentation required for assessment: https://www.ucm.es/diqm/trabajo-fin-de-grado.

## 8. BIBLIOGRAPHY

To be specified according to the assigned Final Degree Project topic.

## 9. EVALUATION

The FDP will be assessed and graded like any other course unit, with both numerical and qualitative grading.

The final grade awarded by the Assessment Panel will be determined by taking into account the academic tutor's report, the written report, the oral presentation and the knowledge demonstrated by the student:

- Tutor’s report: 30% of the final grade.
- Written report: 35%.
- Oral presentation, defence of the FDP and knowledge demonstrated by the student: 35%.

The grade will be based on an absolute score out of 10 points and in accordance with the scale established in RD 1125/2003.

For further information on the different aspects of assessment, students may consult the websites of the Faculty of Chemical Sciences and of the Chemical Engineering Teaching Unit of the Department of Chemical and Materials Engineering.

Before the oral presentation and defence of the FDP, the student must send the Chair and members of the Assessment Panel, by email and within the established deadline, the FDP report in PDF format. The FDP report must include the contents specified in the Course Guide for the course unit. Students who have not submitted the FDP report by the date determined will be recorded as Not Presented.

The student must publicly present a summary of the FDP before the Assessment Panel within a maximum time of 10 minutes. Part of the presentation will be delivered in English. This presentation will be followed by a maximum of 10 minutes of questions and discussion by the Panel.