VNIVERSITAT DE VALÈNCIA

Course Guide
34771 Project management

COURSE DATA

Data Subject	
Code	34771
Name	Project management
Cycle	Grade
ECTS Credits	6.0
Academic year	2024 - 2025

Study (s)

Degree	Center	Acad. year	Period
1401 - Degree in Chemical Engineering	School of Engineering	4	First term

Subject-matter

Degree	Subject-matter	Character
1401 - Degree in Chemical Engineering	13 - Projects	Obligatory

Coordination

Name	Department
GIMENEZ GARCIA, JUAN BAUTISTA	245 - Chemical Engineering
GONZALEZ ALFARO, MARIA VICENTA	245 - Chemical Engineering

SUMMARY

The subject Project Management is a part of the matter Projects, whose overall objective is that students gain the ability to properly apply all previously acquired knowledge about design, development and evaluation of projects and reports, by applying the appropriate methodology and the basic principles of economics, management, quality and organization, as well as legislation, regulation and standardization in the field of industrial chemical engineering. To do this, the matter of Projects covers both organizational and managerial aspects of production, as well as project management. As far as the subject of Project Management is concerned, it is a compulsory subject, four-monthly, which is taught in the fourth year of an undergraduate degree in Chemical Engineering in the first quarter. The curriculum consists of a total of 6 ECTS. This course aims to give students an overview of the great complexity involved in conducting an engineering project in the field of chemical industry. This will provide the methodology to be followed in the preparation of this project, with special emphasis on some stages from conception of the original problem, the study of plausible alternatives, development and design of process equipment for the most appropriate alternative to their economic evaluation to determine the feasibility of the project.

In this course students will also be introduced to concepts related to the various activities that make up the organization and management of industrial projects. Moreover, aspects of the documentation to be submitted, applicable laws and regulations in the development of such projects will be considered. Finally, we provide a basic understanding of the organizational structure and functions of a technical office.

The contents of the course are:
Organizational structure and functions of a technical office. - Methodology and project organization. - Collection and use of information. - Project conception. Synthesis of alternatives. - Calculation and design of equipment and facilities. -Economic evaluation of projects. - Project management. Law and administrative procedures. Professional organization and Basic Procedures in the field of construction and industry. - Management and application specifications, regulations and technical standards.

Seminar: Preliminar design of a chemical plant

The theory classes will be taught in Spanish and the practical activities and laboratory sessions as stated in the assignment form on the web of the degree.

PREVIOUS KNOWLEDGE

Relationship to other subjects of the same degree

There are no specified enrollment restrictions with other subjects of the curriculum.

Other requirements

Given the general nature of the subject in order to address it successfully it is necessary that the student possesses the prior knowledge obtained in the subjects studied in the first six semesters and / or simultaneously in the seventh semester. The world perception of the company and the role of the engineer in the company is presented in the subjects Business and Engineering, Society and University. The skills and knowledge of mathematics and use of ofimatic tools should be developed in areas and subjec

COMPETENCES (RD 1393/2007) // LEARNING OUTCOMES (RD 822/2021)

1401 - Degree in Chemical Engineering

- G1 - Ability to write, sign and develop industrial engineering projects in the field of chemical engineering, according to the aquired knowledge through the specific technology in Industrial Chemistry, aimed at the construction, refurbishment, repair, conservation, demolition, manufacture, installation, assembly and operation of structures, mechanical equipment, energy facilities, electrical and electronic installations, industrial installations and plants, and manufacturing and automation processes.

- G2 - Ability to manage the activities involved in the engineering projects described in the previous heading.
- G4 - Ability to solve problems with initiative, decision-making skills, creativity and critical reasoning and to communicate and transmit knowledge, abilities and skills in the field of industrial engineering.
- G5 - Knowledge to carry out measurements, calculations, assessments, appraisals, surveys, studies, reports, work plans and analogous work.
- G6 - Ability to deal with specifications, regulations and mandatory standards.
- G7 - Ability to analyse and assess the social and environmental impact of technical solutions.
- G10 - Ability to work in a multilingual and multidisciplinary environment.
- G11 - Knowledge, understanding and ability to apply the necessary legislation for practising professionally as a qualified industrial technical engineer.
- R12 - Knowledge and ability to organise and manage projects. Understand the organisational structure and the functions of a project office.

LEARNING OUTCOMES (RD 1393/2007) // NO CONTENT (RD 822/2021)

1. Understanding the basic principles of chemical engineering and be able to use them to create, analyze and select plausible alternatives capable of responding to the problems of their area of work. (G4, R12)
2. Know the basics of security in industrial processes. (G1, G6, G11, R12)
3. Know the organizational structure and functions of an office of projects. (G1, G2, R12)
4. Design processes, equipment and facilities in accordance with standards and specifications. (G1, G5, G6)
5. Apply the environmental aspects in the design of equipment and processes. (G1, G4, G7)
6. To perform the economic evaluation of processes and projects. (G4, R12)
7. Write and develop projects in the field of Chemical Engineering. (G1, G10, R12)
8. Know the professional organization and basic procedures. Knowing the legislation and, in particular, that concerning to prevention and equality. (G6, G11, R12)
9. Be able to work in teams of their field of work or multidisciplinary. (G1, G2, G10, R12)
10. Possess ability to manage information and the use of Information Technology and Communications. (G1, G10, R12)
11. Possess critical thinking skills, creativity and decision-making. (G4, R12)
12. Being able to gather and interpret information and make judgments on issues of social, scientific, technological or ethical. (G1, G4, G6, G7, G10, R12)

13. Possessing learning skills to continue and update their training throughout working life with a high degree of autonomy. (G4, G10)

After completing the course, the student should be able to:
• Identify the characteristics of industrial projects.
• Indicate the steps involved in the performing of an industrial project.
• Understand the organizational aspects in industrial projects.
• Identify the various sources of information available and apply different selection criteria of that information.

• Obtain the information provided by different types of flow charts.
• Propose alternatives that may solve an engineering problem, and select the most appropriate.
• Set up and solve material and energy balances, and design process equipment.

• Understand and assess the different basic economic concepts (investment, costs, sales revenues, profits, taxes, net movements of money) necessary for the economic evaluation of a project.

• Assess the economic viability of a project using updating methods (NPV and RDCF).
• Apply the methods of selection of project investment alternatives.
• Indicate the documents that form part of the final project report and know the information that must be provided by each of them.
• Learn about aspects related to planning, programming, monitoring and control, as part of project management.
• Recognize the organizational structure and functions of a project company.
• Know and apply the necessary legislation in the exercise of the profession of Industrial Engineer.

DESCRIPTION OF CONTENTS

1. THE PROJECT

Definition. Types of projects. The industrial project. Classification of industrial projects. Characteristics of engineering projects.

2. PROJECT METHODOLOGY AND ORGANIZATION

Process System. Design stages of a process. Process engineering. Methodology for the implementation of a project. Engineering projects. Organization of a chemical engineering project.

3. INFORMATION ON PROCESS ENGINEERING

Need for information in process engineering. Classification of information sources. Selection criteria for the information. Information in form of diagrams.

4. PROJECT CONCEPTION. SYNTHESIS OF ALTERNATIVES

Preliminary study. Project conception: Initial approach to the problem. Creating alternatives. Analysis and preliminary screening of alternatives.

5. EQUIPMENT AND FACILITIES DESIGN

Summary of procedures for design and operation of equipment used in chemical process industry. Rules of thumb.

6. ECONOMIC EVALUATION OF PROJECTS. BASICS

Investment: components and estimation methods. Costs: classification and estimation methods. Sales revenue. Income tax.

7. ECONOMIC EVALUATION AND SELECTION OF PROJECTS

Annual net profits and net cash flows. Alternative methods of investment evaluation: classification and description. Criteria for the selection of investment alternatives.

8. PROJECT DOCUMENTS

The Memory. The Plans. The specifications. The budget.

9. INDUSTRIAL PROJECT LEGAL

Project authorization of facilities and industrial plants. The legislation and the project. Standards. Legal scope of the industrial project. Legal provisions related to industrial projects.

10. PROJECT MANAGEMENT

Introduction to planning, programming, monitoring and control of Industrial Projects.

11. ORGANIZATION STRUCTURE OF ENGINEERING COMPANY

Operations and structural engineering company. Free exercise engineer. The project technical office. The company projects. Professional organization: professional associations.

12. SEMINAR

Preliminary design of an industrial plant for the production of acetic anhydride.

WORKLOAD

ACTIVITY	Hours	% To be attended
Classroom practices	26,00	100
Theory classes	20,00	100
Laboratory practices	14,00	100
Development of group work	5,00	0
Development of individual work	5,00	0
Study and independent work	30,00	0
Readings supplementary material	5,00	0
Preparation of evaluation activities	5,00	0
Preparing lectures	10,00	0
Preparation of practical classes and problem	15,00	0
Resolution of case studies	15,00	0
TOTAL	**150,00**	

TEACHING METHODOLOGY

The development of the course is structured around theory and problems classes, laboratory sessions (seminar) and the performance of works.

In the theory classes the lecture model will be used. Professors will explain the contents of each issue, focusing on key aspects for their comprehension. (G1, G2, G4, G5, G6, G7, G11, R12)

Practical classes of problems will be developed following two different models. In some classes the professors solves a series of sample problems so that students learn to identify the essential elements of the approach and resolution of the problems. In the other classes of problems the students will solve, individually or in groups, similar problems under the supervision of the professors. After the work, the problems will be collected, analyzed and corrected by the professors or by the students themselves (G1, G2, G4, G5, G6, G7, G10, G11, R12). These are non-recoverable activities.

Laboratory practice sessions will be a seminar, in which the preliminary design of a chemical process plant will take place. These sessions will be held in small groups under the supervision of the professor. Activities of introduction to the design of process equipment, development and analysis of the results, leading to its economic evaluation will be scheduled. For these activities, a timetable for completion and delivery of work, by student groups, will follow (G1, G4, G5, G6, G7, G10, R12). Attendance at laboratory is a non-recoverable activity and mandatory to pass the course.

The proposed work for the students will be of several types: Questions or short exercises, problems similar in complexity to those of exams, questionnaires and coursework related to the contents of the course. All of these activities will be done in class or at home, and will have a timetable for completion and delivery. After correction, the students will be informed of their results with a summary of their most common mistakes (G1, G2, G4, G5, G6, G7, G10, G11, R12). These are non-recoverable activities.

EVALUATION

In the first call, the evaluation of the students' learning will be carried out from the mark of a final examination, the activities that have been delivered on time throughout the course and the mark of the laboratory. The average mark of the exam must be equal to or greater than 4.5. The final grade will be obtained as the highest of the next two options:

1. The weighting of the grades obtained according to the following percentages:

5% of the non-qualified activities (G1, G2, G4, G5, G6, G7, G10, G11, R12)

25% of the qualified activities (G1, G2, G4, G5, G6, G7, G10, G11, R12)

20% of the laboratory (G1, G4, G5, G6, G7, R12)

50% of the final examination (G1, G2, G4, G5, G6, G7, G11, R12)

2. The weighting of the grades obtained according to the following percentages:

5% of the qualified activities (G1, G2, G4, G5, G6, G7, G10, G11, R12)

20% of the laboratory (G1, G4, G5, G6, G7, R12)

75% of the final examination (G1, G2, G4, G5, G6, G7, G11, R12)

To pass the subject, you must obtain a final grade equal to or greater than 5. If the final exam grade is lower than 4.5, the grade of the first call will be that of the final exam.

Students who have not passed the subject in first call must take the examination of a second call, and the final grade will be calculated following the same criteria as in the first call.

For the advancement of the assessment it is essential to assist the laboratory in a previous year.

Anyhow, the evaluation system will be based on the guides stated in the “Reglament d’Avaluació i Qualificació de la Universitat de València per a Graus i Màsters” (ACGUV 108/2017).

Copying or plagiarism of any activity that is part of the evaluation will result in the impossibility of passing the course, and the student will then be subject to the appropriate disciplinary procedures indicated in the ACTION PROTOCOL FOR FRAUDULENT PRACTICES AT THE UNIVERSITY OF VALENCIA (ACGUV 123/2020).

REFERENCES

Basic

- Teoría General del Proyecto. Vol. I: Dirección de Proyectos
  Cos Castillo, M.; Ed. Síntesis (1997)

- Teoría General del Proyecto. Vol. II: Ingeniería de Proyectos
  Cos Castillo, M.; Ed. Síntesis (1997)
- Analysis, Synthesis and Design of Chemical Processes
  Turton, R., Bailie, R.C., Whiting, W.B., Shaeiwitz, J.A., Bhattacharyya, D. 4th ed, Prentice Hall 2012.

Additional

- Dirección y Gestión de Proyectos
  Gómez Senent, E., Chiner, M., Capuz, S.; SPUPV (1994)
- Las fases del proyecto y su metodología
  Gómez Senent, E.; SPUPV (1992)
- Introducción al proyecto
  Gómez Senent, E.; SPUPV (1989)
- Cuadernos de Ingeniería de Proyectos I: Diseño Básico (Anteproyecto) de Plantas Industriales
  Gómez Senent, E., Gómez-Senent, D., Aragonés, P., Sánchez, M.A., López, D.; SPUPV (1997)
- Dirección y Gestión de Proyectos
  Perreña Brand, J.; Díaz de Santos (1996)
- Plant Design and Economics for Chemical Engineers
  Peters, M.S., Timmerhaus, K.D.; McGraw-Hill (1991)
- Project Evaluation in the Chemical Process Industries
  Valle-Riestra, J.F.; McGraw-Hill (1983)
- El pronóstico económico en química industrial
  Vian Ortuño, A.; Eudema (1991)
- Estrategia en Ingeniería de Procesos
  D.F. Rudd; Ch.C. Watson. Ed. Alhambra (1976)
- Evaluación de inversions industriales
  E. Richart Jordá. Ed. Alhambra (1977)
- Chemical Engineering Design: Principles, Practice and Economics of Plant and Process Design
  Towler, G.P.; Sinnott, R.K. 2nd ed, Butterworth-Heinemann 2013. Ebook en UV