COURSE DATA

Data Subject	
Code	34754
Name	Engineering, society and university
Cycle	Grade
ECTS Credits	6.0
Academic year	2023 - 2024

Study (s)

Degree	Center	Acad. year	Period
1401 - Degree in Chemical Engineering	School of Engineering	1	First term

Subject-matter

Degree	Subject-matter	Character
1401 - Degree in Chemical Engineering	22 - Engineering, society and university	Obligatory

Coordination

Name	Department
IZQUIERDO SANCHIS, MARTA	245 - Chemical Engineering
JIMENEZ ANTOLIN, MARIA DEL CARMEN	270 - Research Methodology, Educational Diagnosis and Assessment
RUIZ CASTELL, PEDRO	225 - History of Science and Documentation

SUMMARY

The subject Engineering, Society and University is compulsory in the first course of the degree in Chemical Engineering. Comprises 6 ECTS and is taught in the first semester of the first course.

This subject aims to place the new students in the context in which they will develop both their studies and their profession once they graduate. To do this, the subject is divided into two main blocks. In the first, work aims fcilitating the integration of college students, providing them with knowledge and tools to facilitate the transition from high school to college.

The second section provides an overview of engineering in their various specialties and in particular of one of chemical engineering as seen from the perspective of their relations with science, technology, economics, society and the environment. It is to show the profession accounting for the implications of this in the development of societies, stressing at all times, in the ethical and environmental commitments of the engineer as well as in the principles of equality of opportunity, democratic values and culture of peace.

The main **objectives** of the course are:

- Facilitate the incorporation and integration of students into university life, especially in graduate studies in Chemical Engineering:
  - structure and organization of the University of Valencia
  - services and human resources, administrative and information offered by the University of Valencia
  - objectives, content and studies program.
- Develop an action plan to guide and tutorial following the process of joining the university.
- Encourage student participation in representative bodies and academic extracurricular activities.
- Develop transferable skills: planning time and study skills, management of information technologies and communication tools for calculation and presentation of documents, reports, and literature search, basic laboratory and experimentation techniques.
- Provide a historical perspective of engineering, its major periods and problems, all within the context of its relations with science, technology, economy, society and the environment.
- Provide a vision of sex / gender system given equal opportunities, incentives and obstacles for women in the areas of engineering.
- Provide an overview of the features of the scientific and technical terminology.
- Encourage and foster in students those values and attitudes that should be inherent to an engineer.
- Disseminate the profiles and the areas of performance of engineering graduates.

The course **contents** are:

- Introduction to college. Mentoring program for new students. Structure of the university. Curriculum. Study techniques and troubleshooting. Tools for access to Information: Library, corporate website, corporate email, e-learning platform.
- Engineering and society:
  - Engineer in the company and management. Professional ethics.
  - Sustainable development and environmental responsibility.
  - Equality opportunities and gender: incentives and barriers.

To cover the course content is organized into two parts distributed according to:

Part I. Joining the University and graduate studies in Chemical Engineering: thematic units 1 to 9.

Part II. Engineering, Chemical Engineering and Society: Thematic units 10 to 14.

The theory lessons will be taught in Spanish and the practical and laboratory classes as stated in the course sheet available 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

OUTCOMES

1401 - Degree in Chemical Engineering

- 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.
- G7 - Ability to analyse and assess the social and environmental impact of technical solutions.
- G9 - Ability to organise and plan work in companies and in other institutions and organisations.
- 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.

LEARNING OUTCOMES

Learning outcomes:

- Know the structure of university services and student participation bodies (G9).
- Understand the structure of the curriculum and the role of each subject in engineering education (G9).
- Acquiring skills in information management and use of the university web tools (G9).
- Acquire organizational skills and planning (G9).
- Acquire skills in the application of methodologies for study and solve engineering problems (G4).
- Develop critical thinking skills, creativity and decision making (G4).
- Gain a general understanding of the engineering profession, including gender perspective (G7, G11).
- Understand the ethical and professional responsibilities and be aware of the impact of engineering solutions in the social and environmental context (G7, G10).
- Understand the areas of performance in business and administration (G7, G10, G11).
- Be able to gather information and make judgments on issues of social, scientific, technological or ethical concern (G7).
- Be able to reflect on issues of equal opportunity, democratic values and a culture of peace (G7).

Skills to be acquired:

The student should be able to:

- Recognize the structure and organization of the University of Valencia.
- Identify services and human resources, administrative and informatics, offered by the University of Valencia.

- Recognize the structure, organization and services at the ETSE.
- Relate the objectives, and contents of the study program.
- List the representative bodies of students.
- Complete planning of time models.
- Apply study skills.
- Manage information technology and communication.
- Manage calculation tools and presentation of documents.
- Prepare reports.
- Conduct literature and legislation searches.
- Use basic laboratory and experimentation techniques.
- Gain a historical perspective of technology development, its main stages, characters and problems.
- Analyze relationships with rigor of engineering with science, technology, economics, society and the environment.
- Assessing equal opportunities, incentives and obstacles that women find in the areas of engineering.
- Define engineering and differentiate the various branches of the same.
- Recognize the engineering-related occupations in their respective spheres of action.
- Identify own working methods of engineering.
- Learn to properly manage scientific and technical terminology.
- Define chemical engineering and explain its relationship to the process industry.
- Recognize the professional profiles and areas of performance of graduates in Chemical Engineering.
- Analyze the values and attitudes relating to the practice of engineering.

In addition to the specific objectives mentioned above, the course will encourage the development of several **social and technical skills**, among which include:

- Capacity for analysis and synthesis.
- Ability to argue from rational and logical criteria.
- Ability to communicate properly and organized.
- Ability to personal work.
- Ability to work in groups.

DESCRIPTION OF CONTENTS

1. Host activity.

Host session. Objectives of the studies. Organization of the first course: school calendar, timetable, exam schedule. Agenda.

2. The University of Valencia. Presentation and structure.

History of the University. Mission. Structure. Campus and Centers.

3. ETSE.

Organization of School: Central Board, Departments, Commissions. Academic Title Committee. ADR and student representation. Secretariat. Facilities. Emergency procedures. Quality programs, mobility and placement. Web ETSE.

4. Resources and Services University of Valencia.

SEDI, CAL, OPAL, University Library, Physical Education and Sports, Students, SFP, Safety, Health and Environmental Quality. Virtual Secretary. Email. Virtual Classroom. Web of the University of Valencia.

5. Graduate Studies in Chemical Engineering.

Legal Framework. Curriculum at the University of Valencia. Curriculum at other universities. Postgraduate studies.

6. Tutorial Action Plan for new students.

Mentoring and guidance on topics of subjects, study methods, planning of activities and difficulties detection and monitoring of incorporation.

7. Work planning and study techniques.

Agenda organization, planning of study in higher education: planning for the short, medium and longterm. Factors influencing the study. Reading. Basic teaching techniques and active study, underline and outline, abstract, memorization and recitation. Structuring reports.

8. ICT tools in graduate studies in Chemical Engineering.

Handling word processing, spreadsheet, presentation programs.

9. Basic laboratory and experimentation techniques.

Safety in the laboratory. Common material handling in a laboratory of Chemical Engineering. Measure mass, volume, flow, temperature, pressure.

10. History of technology.

Main periods in the history of technology. Introduction: primitive techniques, technology in the Ancientworld, the Middle Ages and the Scientific Revolution. Industrial Revolution. Technology in 19th century.Technoscience in 20th century.

11. Science, technology and society.

Introduction. Technological systems. Technological innovation and scientific research. Transfer and spread of technological novelties. Technology and gender. Women in technology. Technology and socio-economic development. Technology and environment. Technology and culture.

12. Work methods in science and technology.

Introduction to the problem of the scientific method. Scientific and technical terminology. Technological information: oral, written and graphical communication. The technical report. Patent systems and the protection of inventions. Circulation of information in science and technology. Recovery of information:databases, encyclopedias, reference

13. Engineering as a profession.

Professions and occupations in science and technology. Scientific and technological disciplines. Theformation and development of specialities. The teaching of science and technology. The control ofprofessional practice. The role of experts in contemporary societies. Technology and risk society.Engineering and its application fields: industry, utility companies, public administration. Professionalassociations. Ethics and professional deontology. Technology and its current and future challenges.

14. Chemical Engineering and Chemical Engineer

Industrial activity and the process industry. The emergence and evolution of chemical engineering. Definition of chemical engineering. The industrial engineer and chemical engineer. Functions of the chemical engineer in the industrial enterprise in the service business and in administration. Current challenges for chemical engineering.

WORKLOAD

ACTIVITY	Hours	% To be attended
Classroom practices	25,00	100
Theory classes	25,00	100
Laboratory practices	10,00	100
Development of individual work	40,00	0
Preparation of evaluation activities	15,00	0
Preparing lectures	15,00	0
Preparation of practical classes and problem	20,00	0
TOTAL	**150,00**	

TEACHING METHODOLOGY

The development of the course is structured around the theory classes, practical classes and seminars, lectures, tutorials and completion of work.

In the lectures the teacher will present and explain the contents of each issue to highlight those key aspects of comprehension. (G7, G9, G11)

In practical classes and seminars students, under the direction and supervision of staff, will carry out work and presentation and discussion of issues. Include activities in the computer classroom (see web pages, databases, using tools, etc.) and in the laboratory (basic techniques) or workshops (study skills workshops, presentations, etc.). (G4, G7, G9, G10)

To complement this training a series of lectures by professionals who provide students with the vision of the profession and field performance of graduates are scheduled. (G7, G10, G11)

The tutorials in this course will guide in matters of subjects, study methods, planning and detection of problems and monitor the incorporation of the student to college. (G9)

The proposed work will include both the student reporting and work as the development of questionnaires, in many cases as self-correcting tests in the e-learning platform Aula Virtual, aimed at preparing and / or strengthen the most important concepts of each topic. Some of these activities will be held in class schedule and the rest will have a timetable for completion and delivery by the students. Delivery of activities will be via Aula Virtual. After correction, the students will be informed of their results. (G4, G7, G9)

EVALUATION

The assessment of student learning will be realized following two models, Type A (or continuous assessment) and Mode B, which will be directed to verify that they have assimilated the basic concepts and they have worked on skills acquisition.

Method A - Continuous evaluation.

Continuous assessment: degree of participation and involvement in the teaching-learning process, taking into account participation, planned activities and completion of questionnaires and proposed work and grading. The percentage allocation of each part of continuous assessment is as follows:

- Participation (G4, G7, G9): 10%.
- Evaluable questionnaires and activities (G4, G7, G9, G10, G11): 70% (in the virtual classroom quizzes, activities in the classroom and laboratory sessions, etc.).
- Final Work (G4, G7, G9): 20%

The mark of the Final Work must be equal or higher than 5,0 points over 10 to pass the subject in Method A.

Students who choose the continuous assessment (Method A) and do not perform 80% of all activities (questionnaires, work, memories, etc..) or do not pass the subject will have to attend to the firt call exam and evaluation form will then be the method B.

Method B.

In method B, there will be a test of basic knowledge and skills in the official date. Finally, for students who carried out the questionnaires, activities and work for continuous assessment, will be considered and evaluated up to 2,5 points out of 10. In summary, the weighting of each part of the mode B will be:

- Theoretical and practical examination in the official call (G4, G7, G9, G10, G11): 75%.
- Questionnaires and assessments carried out activities in the continuous evaluation (G4, G7, G9, G10, G11): 25%.

In the second round evaluation form is the form B.

Non-recoverable activities: attendance at laboratory sessions (computer and experimental) and Final Work.

In any case, the evaluation system will be governed by that established in the Reglament d'Avaluació i Qualificació de la Universitat de València per a Títols de Grau i Màster (http://links.uv.es/7S40pjF).

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