COURSE DATA

DATA SUBJECT

Code: 34784
Name: Industrial safety and occupational risk prevention
Cycle: Undergraduate Studies
ECTS Credits: 4.5
Academic year: 2026-27

STUDY (S)

Degree	Center	Acad. year	Period
1401 - Degree in Chemical Engineering	Escola Tècnica Superior d'Enginyeria	4	Second quarter

SUBJECT-MATTER

Degree	Subject-matter	Character
1401 - Degree in Chemical Engineering	Optional subjects	ELECTIVES

COORDINATION

SANCHIS MARTINEZ RUT

SUMMARY

This optional course ***Industrial safety and occupational risk prevention***, is taught in the fourth degree course in chemical engineering and is a continuation of the safety content taught in the former course: Organization and Production Management.

The goal of this course is to provide a fundamental knowledge needed to address safety both from the industrial point of view as from the point of view of prevention of occupational hazards, in all policy areas of mechanical engineering, including project design and safe industrial facilities and the safe operation of the same. This implies a focus towards the management of industrial and labor safety in the field of industrial plants, especially in chemical plants, and the prevention of accidents.

On the other hand, graduates in chemical engineering degree should know and be familiar with all legal regulations surrounding the security as they must comply with such regulations. Therefore, one of the specific objectives of the course is that students know, understand and be able to apply these regulations in industrial and occupational safety, both in the design and in the operational phases.

As a result of this, the course is divided into three distinct parts. The first part deals with the general concepts of safety and addresses the basic legislative framework.

A second part is directed to the knowledge of the specific industrial and occupational safety regulatory development derived from the basic legal framework. This part will cover areas such as: safety of workplaces and their signage, safety in the use of work equipment, fire safety, particularly in the industrial establishments, the basic rule of self-protection, the use of personal protective equipment, ...

This part deal also with specific security issues that have to do with common risks related to chemical and as they are preventing serious accidents in establishments that use and store hazardous substances, electrical hazard prevention, the risks from static electricity prevention, safety and maintenance tasks, as a particular case, the security work in confined spaces, the risks in the work with explosive atmospheres or major health hazards.

Finally, once explained all technical and legal aspects, the third part deal exclusively to the management of both industrial safety and the work to develop a range of topics such as risk assessment and planning of preventive , Plan of occupational risk prevention, management systems of standardized occupational risk prevention, management of accidents, including the investigation of them, coordination of business activities, preventive management in the field of construction facilities and infrastructure, or safety inspections.

Observations: The classes will be taught in the language as stated in the course sheet available on the website 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

It is recommended that the student has previously acquired knowledge that will help them to understand all the technical and legal concepts that are involved in the context of industrial facilities. It is therefore recommended that students have the following knowledge:
- Principles and basic concepts of industrial safety and occupational acquired in the course of organization and production management.

COMPETENCES / LEARNING OUTCOMES

1401 - Degree in Chemical Engineering

Act autonomously in learning, make informed decisions in different contexts, issue judgements based on experimentation and analysis and transfer knowledge to new situations.

Contribute to the design, development and implementation of solutions that respond to social demands, guided by the Sustainable Development Goals.

Demonstrate critical and self-critical thinking, considering professional ethics, moral values and social

implications of the different activities carried out throughout the degree.

Propose creative and innovative solutions to complex situations or problems, typical of the area of ¿¿¿¿connection, to donate responses to the various professional and social needs

Recognise and apply the basic principles of the various subjects within this applied and professional field to deepen the learning outcomes already covered in the core subjects.

DESCRIPTION OF CONTENTS

1. Basic principles of industrial and labor safety

a. Basics safety and health at work.
b. The different sources of regulations on safety. The double regulation.
c. Spanish Law 31/1995, prevention of occupational hazards. RD 39/97, which approves the regulation of prevention services.
d. Spanish Law 21/1992, of industry. Industrial regulations

2. Main risks and preventive measures in matter of safety. Regulations

a. The safety of the workplace and its signage.
b. The safe use of work equipment. The safety regulations of the machines and commissioning of the same.
c. Principles regarding fire safety. Fire safety in industrial establishments.
d. The basic rule of self-protection.
e. The electrical hazard. The problem of static electricity.
f. The risk in work in explosive atmospheres (ATEX). Working equipment. The safety regulations in equipment that will be used in ATEX atmospheres.
g. Safety in industrial maintenance. Application to the case of work in confined spaces.
h. Use of personal protective equipment. The safety rules of personal protective equipment.
i. The risks in the handling and storage of chemicals.
j. Hygiene risk.
k. Safety in chemical plants. Serious accidents in industrial establishments where dangerous substances handled and stored. The emergency plan. The safety report.
l. Analysis of risks, consequences and vulnerability.

3. Basic principles of management of the industrial and labor safety

a. The risk assessment and planning of preventive activity.
b. The coordination of industrial and business activities.
c. The management of accidents. The accident investigation.
d. The plan of prevention of occupational hazards. Other standardized management systems.
e. Managing labor safety modifications / extensions of facilities.
f. Safety inspections.
g. The work planned observations.

WORKLOAD

PRESENCIAL ACTIVITIES

Activity	Hours
Theory	25,00
Classroom practices	20,00
Total hours	**45,00**

NON PRESENCIAL ACTIVITIES

Activity	Hours
Attendance at other activities	0,00
Individual or group project	20,00
Independent study and work	37,50
Preparation of lessons	10,00
Preparation for assessment activities	0,00
Resolution of case studies	0,00
Total hours	**67,50**

TEACHING METHODOLOGY

The development of the course is structured around classes of theory and problems. Moreover a home work will be carried out.

In theory classes the lecture model will be used. The teacher will present on presentation and / or explain the contents of each issue to highlight those key aspects for understanding.

The practical classes of problems are developed following two models. In some classes the teacher will resolve a number of problems so that students learn to identify the essential elements of the approach and problem resolution. In other kinds of problems it will be students, individually or arranged in clusters, who

should solve similar problems under the supervision of the teacher. After the work, the problems will be collected, analyzed and corrected by the teacher or by the students themselves.

The homework proposed (worked individually or in groups) will have a timetable for completion and delivery by the students. After correction, the students will be informed of their results and a summary of the most consolidated and more frequent failures.

EVALUATION

The evaluation consists of different tests:

Exam (EX): Written test of open response type, test and/or short/long problems on the contents worked in the classroom. Minimum exam = 4.0

Works (TR): Elaboration of one or several group works and corresponding memories. Deliveries of sections TR are not recoverable between calls. Minimum weighted average of the works = 4.0.

Based on these evaluation evidences, 2 modalities are established, with the final grade corresponding to the higher of both:

Modality A: 70% · EX + 30% · TR

Mode B: 100% · EX

In case of not exceeding the minimum grade in the written test, the grade will be EX. In no case will the grade of any thematic unit be kept between exams.

Exceeded the minimum EX grade, in case of not exceeding the minimum grade in TR, the grade will be determined by the one obtained through modality B.

The evaluation methodology is valid for the first and second call. 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

- Técnicas de Prevención de Riesgos Laborales, J. M. Cortés Díaz, Tebar, 2003
- Manual para la Prevención de Riesgos Laborales, G. López Etxebarría, CISS PRAXIS, 2001
- Manual de seguridad industrial en plantas químicas y petroleras. Mc Graw Hill. J.M. Storch de Gracia.
- Análisis y reducción de riesgos en la industria química. Fundación MAPFRE. J.M. Santamaría Ramiro, P.A. Braña Aísa..
- Sistemas de gestión de riesgos laborales e industriales. Fundación MAPFRE. Germán Burriel LLuna.
- Notas Técnicas de Prevención publicadas por el Instituto Nacional de Seguridad e Higiene en el Trabajo.
- Guías Técnicas de Aplicación de la normativa en materia de prevención de riesgos laborales publicadas por el Instituto Nacional de Seguridad e Higiene en el Trabajo.
- Anàlisi del risc en Installacions industrials. Casal, Montiel, Planas i Vilchez, UPC, 2012.