

**COURSE DATA****Data Subject**

Code	34784
Name	Industrial safety and occupational risk prevention
Cycle	Grade
ECTS Credits	4.5
Academic year	2019 - 2020

Study (s)

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

Subject-matter

Degree	Subject-matter	Character
1401 - Degree in Chemical Engineering	23 - Optional subjects	Optional

Coordination

Name	Department
BELTRAN TAURA, PAULA	245 - Chemical Engineering

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: the 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, etc.. 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.

The theory classes will be taught in Spanish 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

Requisits o recomanacions prèvies

It is necessary 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 necessary that students have the following knowledge:

1. Principles and basic concepts of industrial safety and occupational acquired in the course of organization and production management.
2. Skill and knowledge of the use of mathematical tools .
3. Knowledge

OUTCOMES



1401 - Degree in Chemical Engineering

- O1 - More comprehensive skills than those acquired in compulsory subjects.

LEARNING OUTCOMES

1. Understand the basic principles of industrial safety and labor and the different legal sources (Skill O1).
2. Know the basics of security in industrial processes and industrial utilities (Skill O1).
3. Know the risks to which workers are exposed at work in industrial area and the preventive measures to be taken to diminish these risks (Skill O1).
4. Apply the principles of preventive action in both the industrial plant installation and the operation of these, including maintenance, coordination of business activities, as well as alterations, modifications (Skill O1).
5. Know and apply regulations in industrial safety and risk prevention (Skill O1).
6. Know the different ways of preventive organization (Skill O1).
7. Know how to apply the main analytical control methodologies in industrial and labor safety (Skill O1).
8. Know and understand the main forms and tools of security management in business industrial organizations (Skill O1).
9. Design processes, equipment and facilities safe and comply with the safe regulations (Skill O1).
10. Know the basic principles underlying the occupational risk assessment and planning of preventive activity (Skill O1).
11. Learn the basic principles of the plan of risk prevention and most important standard management systems of risk prevention (Skill O1).
12. Be able to work in multidisciplinary work teams (Skill O1).
13. Possess ability to manage information and the use of information technology and communications (Skill O1).
14. Possess critical thinking skills, creativity and decision-making (Skill O1).
15. Be able to solve problems in the technical-safety legal-industry, gather and interpret information, make judgments of value and take decisions (Skill O1).
16. Possess learning skills to continue and update their training throughout working life with a high degree of autonomy (Skill O1).
17. Know and understand the main risks in the chemical industry (Skill O1).



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**

ACTIVITY	Hours	% To be attended
Theory classes	25,00	100
Classroom practices	20,00	100
Development of individual work	20,00	0
Study and independent work	37,50	0
Preparing lectures	5,00	0
Preparation of practical classes and problem	5,00	0
TOTAL	112,50	

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.

(Skill O1).

EVALUATION

Assessment of student learning will take place proposing two types of evaluation:

A) This method only applies to students who have attended more than 80% of the classes. About 10% of the grade will be for the assessment of student attendance and participation. About 25% of the grade will correspond to the evaluation of the individual or group work. The remaining 65% will be for the a write exam. It will be a minimum requirement to pass the course get at least 4.0 on this exam.



B) The rating is derived from the note of an exam (75%) to be held on the official date and the grade earned at homework (25%). Minimum requirement get at least 4.0 in the write exam.

Students who opt for option A), and who do not pass the course in the first call of this form must be submitted to the examination of the second call and the evaluation form will then be of the form B).

Individual or team work is not recoverable.

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

REFERENCES

Basic

- Técnicas de Prevención de Riesgos Laborales, J. M. Cortés Díaz, Tebar, 2003
- Manual para la Prevención de Riesgos Laborales, G. López Etxebarria, 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.

Additional

- 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.

ADDENDUM COVID-19

This addendum will only be activated if the health situation requires so and with the prior agreement of the Governing Council

1. Contenidos

Se reducen los contenidos inicialmente recogidos en la guía docente seleccionando los conceptos indispensables para adquirir las competencias. Únicamente se considera que se dejan por dar 4 temas del último bloque de la asignatura (3.c, 3.d, 3.f y 3.g) de los 23 temas de la asignatura, que amplían conceptos básicos ya adquiridos en la asignatura de OGP (obligatoria de 3º).



2. Volumen de trabajo y planificación temporal de la docencia

La guía docente preveía 45 horas de clase, combinando la teoría con la práctica.

En el momento del inicio de la docencia no presencial se ha impartido el 67% de horas de la asignatura.

La dedicación a las sesiones de teoría y prácticas se trasladan al tiempo de aprendizaje autónomo del estudiante con los materiales subidos al aula virtual.

3. Metodología docente

Sustitución de la clase presencial por subida al aula virtual de los materiales para estas sesiones (presentaciones de diapositivas, videos de formación con explicación de teoría y problemas resueltos).

Hasta mayo, cada semana se realizará una videoconferencia con los alumnos (mediante la herramienta zoom), donde se tratarán los temas que sean necesarios (dudas que puedan aparecer sobre el material docente, sobre la tarea a entregar,...). Además, se mantendrá el programa de tutorías virtuales (atención en 48 horas laborales máximo por correo electrónico).

Se va a establecer la entrega de unas cuestiones prácticas a través del aula virtual. Estas cuestiones implican trabajar todo el contenido impartido en la asignatura. En un principio estaba planificado que se realizase por grupos de 4 personas, pero ahora se va a pedir de manera individual ya que se le va a dar más peso en la evaluación.

Las fechas de entrega serán las que se especifiquen en las tareas de aula virtual, planificándose con tiempo suficiente para su entrega en condiciones adecuadas.

4. Evaluación

TRABAJOS

Se mantiene la modalidad de evaluación de esta sección.

EXAMEN

Se mantiene la modalidad de evaluación de esta sección. El examen se llevará a cabo en el horario propuesto por el centro, de forma telemática, a través del aula virtual. Será la hora que figure en la actividad Tarea del aula virtual como hora de entrega la que se tenga en cuenta para entender que se ha entregado en plazo. Los estudiantes deberán estar conectados mediante videoconferencia BBC con la cámara activada y el micrófono silenciado.



Si una persona no dispone de los medios para establecer esta conexión y acceder al aula virtual, deberá contactar con el profesorado por correo electrónico en el momento de publicación de este anexo a la guía docente.

La prueba estará basada en una batería de preguntas de respuesta múltiple, que se genera de forma automática y aleatoria a partir de un banco de preguntas de dificultad homogénea. Se estima un tiempo de 3 minutos por cada pregunta.

CALIFICACIÓN FINAL

Se elimina la calificación mínima de la media ponderada de los trabajos.

Para dar mayor prevalencia a la evaluación continua y al trabajo individual, se modifica la ponderación final de cada una de las secciones, siendo:

Modalidad A

25% Examen (pasa del 65 al 50)

65% Trabajos (pasa del 25 al 65)

10% Asistencia/Participación del alumno

Se necesita una nota igual o superior a 4.0 en el examen para aprobar la asignatura.

Modalidad B

90% Examen

10% Asistencia/Participación del alumno

La calificación será la superior a las modalidades A y B.

Ambas modalidades se consideran tanto para la primera como para la segunda convocatoria.

5. Bibliografía

Se sustituyen los manuales recomendados por los apuntes y diapositivas locutadas que se suben al aula virtual.