SUBJECT TEACHING GUIDE

G797 - Risk Prevention in Industry

Degree in Chemical Engineering

Academic year 2023-2024

1. IDENTIFYING DATA					
Degree	Degree in Chemical Engineering			Type and Year	Optional. Year 4
Faculty	School of Industrial Engineering and Telecommunications				
Discipline	Subject Area: Option B: Industrial Environmental Management Optional Module				
Course unit title and code	G797 - Risk Prevention in Industry				
Number of ECTS credits allocated	6	Term		Semester based (2)	
Web					
Language of instruction	Spanish	English Friendly	Yes	Mode of delivery	Face-to-face

Department	DPTO. INGENIERIAS QUIMICA Y BIOMOLECULAR
Name of lecturer	RUBEN ALDACO GARCIA
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Other lecturers	ENRIQUE ALVAREZ GUERRA

3.1 LEARNING OUTCOMES
- To be able to identify, analize and assess occupational risks in industry, determining their causes and consequences.
- To be able to control occupational risks in industry by means of the design of effective measures and procedures of prevention and protection.
- To be able to carry out case studies with which the studied concepts can be developed.

4. OBJECTIVES

Methods to identify, analize and assess risks are a very useful tool to address their detection, cause and consequences that may imply, with the purpose of preventing or minimizing these risks as well as limiting their consequences, if they cannot be eliminated.
The main objectives of this course are:
i.To identify and to measure the risks that a factory may cause to people, environment and material goods.
ii.To deduce the possible occupational risks that may occur.
iii.To determine the spatial and temporal consequences of accidents, applying certain vulnerability criteria.
iv.To analize causes of occupational risks.
v.To define prevention and protection measures and procedures to avoid the occurrence and/or to limit the consequences of occupational risks.

6. COURSE ORGANIZATION

	CONTENTS
1	PART I: Occupational risk prevention and control 1. Introduction to occupational risk prevention 1.1. Basic concepts 1.2. Occupational conditions and risk factors 1.3. Legislation on occupational risk prevention 1.4. Prevention at work
2	2. Risk identification and control associated with chemicals 2.1. Occupational toxicology 2.2. Classification, labelling and packaging of chemicals: REACH and CLP regulations 2.3. Measurement, assessment and control of exposure to chemicals
3	3. Risk identification and control associated with physical and biological agents 3.1. Noise, vibrations, radiations and thermal stress 3.2. Main biological agents
4	CASE STUDY: INDUSTRIAL RISK ANALYSIS I
5	PART I: Industrial risk analysis and control 5. Major accidents in industry 5.1. Major accidents 5.2. Fire, explosion and BLEVE 5.3. Toxic cloud dispersion and out-of-control reactions
6	6. Risk analysis 6.1. Risk definition, measurement and tolerance 6.2. Simplified method for estimating risk
7	7. Hazard identification and control 7.1. Hazard and operability study (HAZOP) 7.2. Failure-tree analysis 7.3. Risk indexes
8	CASE STUDY: INDUSTRIAL RISK ANALYSIS II

7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Examination of Part I contents	Written exam	Yes	Yes	10,00
Part I portfolio	Others	No	Yes	10,00
Case study I	Work	No	Yes	30,00
Examination of Part II contents	Written exam	Yes	Yes	10,00
Part II portfolio	Others	No	Yes	10,00
Case study II	Work	No	Yes	30,00
TOTAL				100,00

Observations

Assessment of parts I and II of the course are totally independent.
If the exam on site is not possible due to exceptional circumstances derived from COVID-19, the evaluation will be according to the available tools of the University of Cantabria.

Observations for part-time students

Part-time students will be assessed by means of case studies I and II (60 % of the total score; 30 % each case study) and the course final exam (40 % of the total score).

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC

BIBLIOGRAFIA BLOQUE TEMATICO I
Higiene industrial. Manual práctico. Manuel Jesús Falagán Rojo. Fundación Luis Fernández Velasco (2008).
Fundamentals of Industrial Hygiene. Barbara A. Plog, Patricia J. Quinlan. National Safety Council (2012).
Manual para el Técnico en Prevención de Riesgos Laborales. Agustín González Ruiz, Pedro Mateo Floría, Diego González Maestre. FC Editorial (2015).

BIBLIOGRAFIA BLOQUE TEMATICO II
Análisis del riesgo en instalaciones industriales. Joaquim Casal [et al.]. Barcelona : Edicions UPC, 2001.
Lees' loss prevention in the process industries: hazard identification, assessment, and control. Elsevier/Butterworth-Heinemann, 2012.