Teaching Guide				
Identifying Data				2017/18
Subject (*)	Industrial Safety		Code	610509131
Study programme	Mestrado Universitario en Investigación Química e Química Industrial (Plan 2017)			
Descriptors				
Cycle	Period	Year	Type	Credits
Official Master's Degree	Yearly	First	Optativa	3
Language	Spanish			
Teaching method	Face-to-face			
Prerequisites				
Department	Química			
Coordinador	Riveiros Santiago, Ricardo	E-mail	ricardo.riveiros@udc.es	
Lecturers	Avecilla Porto, Fernando Francisco Riveiros Santiago, Ricardo	E-mail	fernando.avecilla@udc.es ricardo.riveiros@udc.es	
Web				
General description	A industria química está suxeita a unha estricta lexislación en materia de seguridade laboral. Por iso o profesional da química debe de coñecer todos aqueles aspectos que poden dar lugar a situación de risco no solo para as persoas si non, tamén, para os bens e o medioambiente. A seguridade das persoas, dos traballadores e do medioambiente son fundamentáis, hoxe en día, e cada vez máis nas empresas. A xestión da seguridade industrial evita grandes gastos nas empresas xa que as catástrofes xeradas por unha inadecuada xestión se resolven pola vía do código civil e evita que os profesionais se teñan que enfrontar á vía do código penal. Ademas, de xerar unha mala imaxe das empresas na sociedade.			

Study programme competences	
Code	Study programme competences
A1	Define concepts, principles, theories and specialized facts of different areas of chemistry.
A2	Suggest alternatives for solving complex chemical problems related to the different areas of chemistry.
A5	Properly assess risks and environmental and socioeconomic impacts associated with special chemicals
A6	Design processes involving the treatment or disposal of hazardous chemicals
A9	Promote innovation and entrepreneurship in the chemical industry and in research.
B1	Possess knowledge and understanding to provide a basis or opportunity for originality in developing and / or applying ideas, often within a research context
B4	Students should be able to communicate their conclusions, and the knowledge and the reasons that support them to specialists and non-specialists in a clear and unambiguous manner
B5	Students must possess learning skills to allow them to continue studying in a way that will have to be largely self-directed or autonomous.
B9	Demonstrate ability to analyze, describe, organize, plan and manage projects
B10	Use of scientific terminology in English to explain the experimental results in the context of the chemical profession
B11	Apply correctly the new technologies to gather and organize the information to solve problems in the professional activity.
B12	Being able to work in a team and adapt to multidisciplinary teams.

Learning outcomes			
Learning outcomes	Study programme competences		
To form and provide tools to understand the risks of chemicals and their reactions.	AC1 AC2 AC5	BC1 BC4 BC10 BC11 BC12	

To learn how to evaluate and manage the risks associated with chemicals.	AC2 AC5 AC6 AC9	BC1 BC4 BC5 BC9 BC10 BC11 BC12	
To know the complex legal regulations associated with the chemical sector (Seveso Directive, REACH regulation, transport of chemical products, prevention of occupational risks, self-protection plans, etc.).	AC1 AC2 AC5 AC6 AC9	BC1 BC4 BC5 BC9 BC10 BC11 BC12	
To learn how to adapt the reality of the chemical plants to the legal regulations, to minimize the accidents at work, the assets of the company and the entities close to the chemical plant.	AC1 AC2 AC5 AC6 AC9	BC1 BC4 BC5 BC9 BC10 BC11 BC12	

Contents	
Topic	**Sub-topic**
Chapter 1. Chemical products.	? Introduction. ? Typology of risks associated with chemicals. ? Analysis methodology to determine risks.
Chapter 2. Typology of accidents associated with chemicals.	? Fires. ? Explosions ? Spills. ? Leaks.
Chapter 3. Risks for the persons, industrial risks and environmental risks.	? Typology of risks. ? Industrial activities at risk. ? Typology of accidents. ? The regulations: UN, European, national.
Chapter 4. Risk assessment.	? Typology of risk assessments: People, Industrial and Environmental. ? Typology of Methods. ? Software.
Chapter 5. Precautionary measures.	? Typology of Precautionary measures. ? Legislative requirements.

Planning				
Methodologies / tests	**Competencies**	**Ordinary class hours**	**Student?s personal work hours**	**Total hours**
Guest lecture / keynote speech	A1 A2 A5 A6 A9 B1 B4 B5 B9 B10 B11 B12	12	28	40
Seminar	B1 B4 B9 B10 B11 B12	9	18	27
Objective test	B1 B5 B12	2	4	6

Personalized attention		2	0	2
(*)The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.				

Methodologies	
Methodologies	**Description**
Guest lecture / keynote speech	Twelve full group class sessions by videoconference are scheduled. The students will have access to the different materials through the Moodle platform of the UDC.
Seminar	During the seminar classes, exercises and practical cases will be discussed. The student should also develop different papers and written reports and present them orally.
Objective test	The objective test will consist of theoretical, practical and/or theoretical-practical questions about all the contents of the subject.

Personalized attention	
Methodologies	**Description**
Seminar	Students with appreciation a part-time academic and attendance waiver of exemption may complete the seminars in individual and/or group tutoring schedule to be agreed with the teachers. The activities undertaken in these tutorials will be similar to those of students in ordinary regime and consideration for the final assessment.

Assessment			
Methodologies	**Competencies**	**Description**	**Qualification**
Seminar	B1 B4 B9 B10 B11 B12	Continuous evaluation will be the 45% of the final mark and will consist of the following parts: Problem solving and discussion of practical cases (15%), writing reports (10%), oral presentations (papers, 10%) and evaluation through oral questions and questions during the course (10%).	45
Objective test	B1 B5 B12	The objective test will consist of theoretical, practical and/or theoretical-practical questions about all the contents of the subject.	55

Assessment comments
Taking into account that, in the industry, the development of writing reports and oral presentations is important, it will be valued: - Clarity. - Non-spelling errors. - Quick response of the writing reports to be presented by the student. In the case of students with recognition of part-time dedication and academic assistance waiver, the qualification of the seminars will be replaced by that obtained in the personal tutorials. Students who attend fewer than 25% of planned academic activities and do not assist to the objective test, will be qualified as "Not presented".

Sources of information	
Basic	- Storch de Gracia, J. M. (). Manual de seguridad industrial en plantas químicas y petroleras. McGraw-Hill - Carl Roth, Ed (). Manual de seguridad en el laboratorio.

Complementary	- (). R.D. 840/2015 de 21 de septiembre. B.O.E. - (). Normativa A.D.R.. - (). R.D. 379/2001 de 6 de abril. B.O.E. - (). R.D. 130/2017 de 24 de febrero. B.O.E. - U.S. Environmental Protection Agency (). Manual para usuarios del programa ALOHA (Areal Locations Of Hazardous Atmospheres). - (). Reglamento REACH. - (). Reglamento CLP.

Recommendations
Subjects that it is recommended to have taken before
Subjects that are recommended to be taken simultaneously
Industrial Legislation/610509133 Management in Chemical Industry/610509132 Industrial Chemistry: Process control/610509129 Economics and Industry/610509134
Subjects that continue the syllabus
Other comments

(*)The teaching guide is the document in which the URV publishes the information about all its courses. It is a public document and cannot be modified. Only in exceptional cases can it be revised by the competent agent or duly revised so that it is in line with current legislation.