Teaching Guide				
Identifying Data				2019/20
Subject (*)	Chemical Process Engineering		Code	730497204
Study programme	Mestrado Universitario en Enxeñaría Industrial (plan 2018)			
Descriptors				
Cycle	Period	Year	Type	Credits
Official Master's Degree	2nd four-month period	First	Obligatory	4.5
Language	Galician			
Teaching method	Face-to-face			
Prerequisites				
Department	Química			
Coordinador	Ruiz Bolaños, Isabel	E-mail	isabel.ruiz@udc.es	
Lecturers	Ruiz Bolaños, Isabel	E-mail	isabel.ruiz@udc.es	
Web				
General description	O obxecto desta materia é abordar o estudo de procesos da industria química nos que se obteñen produtos básicos (ácidos, bases, fertilizantes, deterxentes, derivados do petróleo, etc.), analizando as materias primas, as etapas do proceso e os impactos que xenera.			

Study programme competences	
Code	Study programme competences
A4	ETI4 - Capacity for the analysis and design of chemical processes.
A5	ETI5 - Knowledge and skills for the design and analysis of machines and thermal engines, hydraulic machines and industrial installations of heat and cold.
B2	CB7 - That students know how to apply the knowledge acquired and their ability to solve problems in new or unfamiliar environments within broader (or multidisciplinary) contexts related to their area of ??study.
B3	CB8 - That students are able to integrate knowledge and face the complexity of making judgments based on information that, being incomplete or limited, includes reflections on the social and ethical responsibilities linked to the application of their knowledge and judgments.
B4	CB9 - That the students know how to communicate their conclusions -and the knowledge and ultimate reasons that sustain them- to specialized and non-specialized audiences in a clear and unambiguous way.
B6	G1 - Have adequate knowledge of the scientific and technological aspects in Industrial Engineering.
B7	G2 - Project, calculate and design products, processes, facilities and plants.
B13	G8 - Apply the knowledge acquired and solve problems in new or unfamiliar environments within broader and multidisciplinary contexts.
B14	G9 - Be able to integrate knowledge and face the complexity of making judgments based on information that, being incomplete or limited, includes reflections on social and ethical responsibilities linked to the application of their knowledge and judgments.
B15	G10 - Knowing how to communicate the conclusions -and the knowledge and ultimate reasons that sustain them- to specialized and non-specialized publics in a clear and unambiguous way.
C1	ABET (a) - An ability to apply knowledge of mathematics, science, and engineering.
C3	ABET (c) - An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
C5	ABET (e) - An ability to identify, formulate, and solve engineering problems.
C6	ABET (f) - An understanding of professional and ethical responsibility.
C7	ABET (g) - An ability to communicate effectively.
C8	ABET (h) - The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.
C11	ABET (k) - An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

Learning outcomes	
Learning outcomes	Study programme competences

Conseguir a adecuación do producto ás esixencias do mercado, así como as normas de ensaio e especificacións de produtos. Ser capaz de desenvolver o proxecto dun proceso químico: consumos e condicións de operación, así como a súa viabilidade técnica. Seguridade básica na industria química. Coñecer os distintos procesos químicos industriais.	AJ4 AJ5	BJ3 BJ6 BJ14	CJ1 CJ8
Identificar as diferentes etapas dun proceso no diagramas de fluxo e ser capaz de realizar calculos básicos no deseño de procesos químicos.	AJ4	BJ2 BJ7 BJ13	CJ1 CJ3 CJ5
Ser capaz de elaborar información relacionada cos procesos químicos e transmitila de forma coherente.	AJ4	BJ4 BJ15	CJ6 CJ7 CJ11

Contents	
Topic	**Sub-topic**
Tema inicial: Os bloques ou temas seguintes desenvolven os contidos establecidos na ficha da Memoria de Verificación, que son:	Análise e deseño de procesos químicos. - Materias primas e produtos básicos. - Deseño e desenvolvemento de procesos na industria química. - Deseño e análise de máquinas e motores térmicos, máquinas hidráulicas e instalacións de calor e frío industrial.
1. Introdución á Industria Química	
2. Materias primas e produtos. Análise do ciclo de vida	
3. Diagramas de fluxo dos procesos químicos. Balances de materia e enerxía.	
4. Estudo de procesos químicos. Obtención de ácidos e bases, fertilizantes, deterxentes, derivados do petróleo, etc.	

Planning				
Methodologies / tests	**Competencies**	**Ordinary class hours**	**Student?s personal work hours**	**Total hours**
Guest lecture / keynote speech	A4 A5 B3 B14 B6 C1 C8	14	14	28
Problem solving	A4 B2 B7 C5	12	24	36
Supervised projects	B4 B13 B15 C3 C6 C7 C11	5	25	30
Oral presentation	B4 B15 C7 C11	4	4	8
Objective test	A4 B3 B6	3	7.5	10.5
Personalized attention		0	0	0
(*)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	Exposición dos aspectos básicos dos temas por parte do profesor.
Problem solving	O estudo dalgúns temas abordarase mediante exercicios propostos e resoltos na aula, en grupos pequenos ou individualmente.
Supervised projects	Os alumnos/as elexirán un proceso químico sobre o que realizarán un traballo en grupos de 3.
Oral presentation	Os grupos exporán o seu traballo ao resto da clase.
Objective test	Consistirá en preguntas cortas e exercicios relacionados cos contidos desenvolvidos.

Personalized attention	
Methodologies	**Description**
Supervised projects	Os alumnos/as con dispensa académica poderán realizar o traballo titorizado de forma individual.

Assessment			
Methodologies	**Competencies**	**Description**	**Qualification**
Supervised projects	B4 B13 B15 C3 C6 C7 C11	A memoria do traballo constará de: obxectivo, introdución, descripción do proceso, impactos ambientais e sociais, conclusións e bibliografía. Terá unha extensión de aproximadamente 20 páxinas e se entregará via Moodle en formato doc.	30
Oral presentation	B4 B15 C7 C11	Os grupos terán que preparar unha exposición de 15-20 min. para presentar o seu traballo ao resto da clase.	10
Problem solving	A4 B2 B7 C5	Proporanse algúns exercicios dos boletíns para a súa entrega ao profesor.	10
Objective test	A4 B3 B6	Para superar a materia haberá que acadar un mínimo de 4 sobre 10 na proba obxectiva.	50

Assessment comments

Sources of information	
Basic	- R.M. Murphy (2007). Introducción a los procesos químicos. Principios, análisis y síntesis.. MacGraw-Hill - M.J. Caselles Pomares (2004). Química aplicada a la ingeniería. UNED - A. Vian (1998). Introducción a la química industrial. Reverté - J.F. Izquierdo (2011). Introducción a la Ingeniería Química: Problemas resueltos de balances de materia y energía. Reverté
Complementary	

Recommendations
Subjects that it is recommended to have taken before
Subjects that are recommended to be taken simultaneously
Subjects that continue the syllabus
Other comments
Para axudar a conseguir un entorno inmediato sostenido e cumprir co obxectivo da acción número 5: "Docencia e investigación saudable e sustentable ambiental e social" do "Plan de Acción Green Campus Ferrol":A entrega dos traballos documentais que se realicen nesta materia serán en formato virtual e/ou soporte informático e se entregarán a través de Moodle sen necesidade de imprimilos.

(*)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.