



Teaching Guide

Identifying Data					2020/21
Subject (*)	Chemical Technology	Code	730G04051		
Study programme	Grao en enxeñaría en Tecnoloxías Industriais				
Descriptors					
Cycle	Period	Year	Type	Credits	
Graduate	1st four-month period	Third	Obligatory	6	
Language	SpanishGalician				
Teaching method	Face-to-face				
Prerequisites					
Department	Enxeñaría Naval e IndustrialQuímica				
Coordinador	Filgueira Vizoso, Almudena	E-mail	almudena.filgueira.vizoso@udc.es		
Lecturers	Filgueira Vizoso, Almudena Rodríguez Guerreiro, Maria Jesus	E-mail	almudena.filgueira.vizoso@udc.es maria.guerreiro@udc.es		
Web					
General description	In this subject students are shown physical separation systems, transfer operations, physical separation systems as well as transfer operations, all applied to industrial chemical processes. Know and design the equipment needed for solid-gas separation To understand the storage possibilities and the problems of the same				
Contingency plan	<p>1. Changes in content</p> <ul style="list-style-type: none">- No changes will be made <p>2. Methodologies</p> <p>Teaching methodologies that are maintained</p> <ul style="list-style-type: none">- Master session- Tutored works (computes in the evaluation)- Laboratory practices (essential to pass the subject)- Mixed probability- Problem solving- Field trips <p>Teaching methodologies that are modified</p> <ul style="list-style-type: none">- Field trips (will not be done in case we are not allowed to do them) <p>3. Mechanisms for personalized attention to students</p> <ul style="list-style-type: none">- Email: Daily. Of use to make consultations, request virtual meetings to resolve doubts and follow up on supervised work.- Moodle: Daily. According to the needs of the students.- Teams: 1 weekly session in a large group to advance two theoretical contents and supervised works in the time slot assigned to the subject in the School's classroom calendar. From 1 to 2 weekly sessions (or more depending on the demand or students) in a small group (up to 6 people), for follow-up and support in carrying out the "supervised work". This dynamic allows a standardized and adjusted monitoring of the learning needs of the students to develop the work of the subject. <p>4. Modifications in the evaluation</p> <p>There will be no modifications to the evaluation. In the event that any of the scheduled activities cannot be scored, this activity will go to the mixed test.</p> <p>5. Modifications of the bibliography or webgraphy</p> <p>No changes will be made.</p>				



Code	Study programme competences / results
A28	TEQ3 Capacidade para o deseño e xestión de procedementos de experimentación aplicada, especialmente para a determinación de propiedades termodinámicas e de transporte, e modelado de fenómenos e sistemas no ámbito da enxeñaría química, sistemas con fluxo de fluídos, transmisión de calor, operacións de transferencia de materia, cinética das reaccións químicas e reactores.
B4	CB4 Que os estudantes poidan transmitir información, ideas, problemas e solucións a un público tanto especializado como leigo
B6	B3 Ser capaz de concibir, deseñar ou poñer en práctica e adoptar un proceso substancial de investigación con rigor científico para resolver calquera problema formulado, así como de comunicar as súas conclusións e os coñecementos e razóns últimas que as sustentan? a un público tanto especializados como leigo dun xeito claro e sen ambigüidades
B7	B5 Ser capaz de realizar unha análise crítica, avaliación e síntese de ideas novas e complexas
B8	B7 Deseñar e realizar investigacións en ámbitos novos ou pouco coñecidos, con aplicación de técnicas de investigación (con metodoloxías tanto cuantitativas como cualitativas) en distintos contextos (ámbito público ou privado, con equipos homoxéneos ou multidisciplinares etc.) para identificar problemas e necesidades
C3	C5 Entender a importancia da cultura emprendedora e coñecer os medios ao alcance das persoas emprendedoras.
C4	C6 Valorar criticamente o coñecemento, a tecnoloxía e a información dispoñible para resolver os problemas cos que deben enfrontarse.
C6	C8 Valorar a importancia que ten a investigación, a innovación e o desenvolvemento tecnolóxico no avance socioeconómico e cultural da sociedade.

Learning outcomes			
Learning outcomes	Study programme competences / results		
Know the physical separation systems as well as the transfer operations applied to the Industrial chemical processes. To know and design the equipment necessary for the development of the Solid-gas separation. Understand storage possibilities and associated issues.	A28	B4 B6 B7 B8	C3 C4 C6

Contents	
Topic	Sub-topic
Blocks or topics to develop the levels laid down in the verification of memory tab	Auxiliary services in industries: introduction to chemical technology, materials protection, water, gas distribution networks. Operations handling: storage of fluids, flow of fluids, measuring and pumping of fluids, piping and accessories, operations with solids. Separation operations: introduction to systems solid, separation (sedimentation and flotation) solid-liquid, solid-liquid separation (filtration and centrifugation), separation of solids and liquids into gases. Transfer operations: solid-liquid extraction, extraction liquidoliquid; Distillation, absorption, adsorption and ion exchange.
AUXILIARY SERVICES IN INDUSTRIES	Introduction to chemical technology Water distribution networks Gases Protection of materials
HANDLING OPERATIONS	Fluid storage Fluid flow Measuring and pumping fluids Pipes and fittings Operations with solids
SEPARATION OPERATIONS	Introduction to solid-fluid systems Solid-liquid separation: sedimentation, flotation, filtration and centrifugation Separation of solids and liquids into gases



MATERIAL TRANSFER OPERATIONS	<p>Solid-liquid extraction</p> <p>Liquid-liquid extraction</p> <p>Distillation</p> <p>Absorption</p> <p>Adsorption and ion exchange</p>
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Planning				
Methodologies / tests	Competencies / Results	Teaching hours (in-person & virtual)	Student?s personal work hours	Total hours
Supervised projects	B6 B7 B8 C3 C4 C6	8	12	20
Field trip	C4	4	2	6
Laboratory practice	A28 B4	6	9	15
Mixed objective/subjective test	A28 B6 B7	0	10	10
Problem solving	B7 C4 C6	7	21	28
Guest lecture / keynote speech	A28 B6 B7	32	32	64
Personalized attention		7	0	7

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

Methodologies	
Methodologies	Description
Supervised projects	It is an option based on the resolution by the students of the responsibility for their own learning. This teaching system is based on two basic elements: the independent learning of the students and the monitoring of this learning by the teacher-tutor
Field trip	Activities developed in a context external to the university academic environment (companies, Institutions, agencies, monuments, etc.) related to the field of study of the subject.
Laboratory practice	Methodology that allows students to learn effectively through practical activities, such as demonstrations, exercises, experiments and research
Mixed objective/subjective test	Exam that integrates standard questions and objective type questions. As for the former, it includes open-ended questions of development, the latter can combine multiple-choice, ranking, short-answer, discrimination, completion and association questions.
Problem solving	Technique through which a specific problem situation has to be solved, based on the knowledge that has been worked on, which may have more than one possible solution
Guest lecture / keynote speech	Oral presentation complemented by the use of audiovisual media in order to transmit knowledge and facilitate learning.

Personalized attention	
Methodologies	Description
Guest lecture / keynote speech Supervised projects Field trip Laboratory practice	<p>Tutored works: assistance to personalized tutorials is recommended. The student will receive guidance on how to start and carry out the work according to the criteria specified below.</p> <p>Oral presentation: made with the support of slides and each group of students will have a set time for it.</p> <p>Laboratory Practices: The student will be cited in advance on the Moodle platform or on the bulletin board of the School. The practices will be carried out in the Laboratory of Chemical Technology and Environment of the Building of Workshops and must be provided with the manual of practices of the subject (Copy-shop)</p> <p>In case of academic dispensation the student will contact the teachers of the subject to agree on the planning of teaching activities, meeting the needs that the student may have within the existing possibilities.</p>



Assessment

Methodologies	Competencies / Results	Description	Qualification
Mixed objective/subjective test	A28 B6 B7	Exam	65
Supervised projects	B6 B7 B8 C3 C4 C6	Protected works will be carried out by the students with the help of teachers of the subject. These works must provide to teachers both in paper format by email or platform designated by the faculty.	30
Laboratory practice	A28 B4	It consists of carrying out the laboratory practices and the final report of the same	5

Assessment comments

It is necessary to take a minimum of 3.5 in the partial exams (if any) and an average of 4 to count the other methodologies. In case there are no partial exams, the necessary grade to be able to do average with the other activities will be 4. In case of not being able to perform any of the above mentioned methodologies the evaluation of the same will pass to the objective test. Attendance at more than 90% of scheduled sessions will be mandatory. In case the field exits are made, they will be obligatory to surpass the subject. The laboratory practices will be necessary to overcome the matter

Sources of information

Basic	<ul style="list-style-type: none"> - J.M.Coulson (). Ingeniería química. - Andrés Arévalo (). Tecnología química. - Ángel Vian Ortuño (). Introducción a la química industrial. - Eugenio Muñoz Camacho (). Ingeniería química. <p>Apuntes de clase e traballosApuntes de clase e traballos</p>
Complementary	

Recommendations

Subjects that it is recommended to have taken before

QUÍMICA/730G04005

Subjects that are recommended to be taken simultaneously

Subjects that continue the syllabus

Other comments

1. The delivery of the documentary works carried out in this matter: 1.1. It will be requested in virtual format and / or computer support. 1.2. It will be done through Moodle, in digital format without the need to print them. 1.3. If done on paper: -No plastics will be used. - Double-sided prints will be made. - Recycled paper will be used. - Draft printing will be avoided. 2.- A sustainable use of resources and the prevention of negative impacts on the natural environment must be made. 3.- The importance of ethical principles related to the values of sustainability in personal and professional behavior must be taken into account. 4.- As stated in the different regulations of application for university teaching, the gender perspective must be incorporated in this matter (non-sexist language will be used, bibliography of authors of both sexes will be used, intervention in class of students will be encouraged and students ...). 5.- Work will be done to identify and modify prejudices and sexist attitudes, and the environment will be influenced to modify them and promote values of respect and equality. 6. Situations of discrimination based on gender must be detected and actions and measures will be proposed to correct them. 7. The full integration of students who for physical, sensorial, psychic or sociocultural reasons, experience difficulties to adequate, equal and beneficial access to university life will be facilitated.

(*)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.