



## Teaching Guide

Teaching Guide				
Identifying Data				2020/21
Subject (*)	Chemistry		Code	730G05004
Study programme	Grao en Enxeñaría Naval e Oceánica			
Descriptors				
Cycle	Period	Year	Type	Credits
Graduate	1st four-month period	First	Basic training	6
Language	Spanish			
Teaching method	Hybrid			
Prerequisites				
Department	Química			
Coordinador	Gonzalez Soto, Elena	E-mail	elena.gsoto@udc.es	
Lecturers	Gonzalez Soto, Elena	E-mail	elena.gsoto@udc.es	
Web				
General description	This subject pretends to form the students in fundamental chemical concepts that will allow them comprise and resolve problems that will present them in their professional life and is basic to other subjects of the career. It contributes knowledges for the understanding of technological applications.			
Contingency plan	1. Modifications to the contents  2. Methodologies *Teaching methodologies that are maintained  *Teaching methodologies that are modified  3. Mechanisms for personalized attention to students  4. Modifications in the evaluation  *Evaluation observations:  5. Modifications to the bibliography or webgraphy			

## Study programme competences

Code	Study programme competences
A4	Have a capacity so that it understands and applies the beginnings of basic knowledge of the general chemist, organic and inorganic chemistry and its applications in the engineering
B1	That the students proved to have and to understand knowledge in an area of study what part of the base of the secondary education, and itself tends to find to a level that, although it leans in advanced text books, it includes also some aspects that knowledge implicates proceeding from the vanguard of its field of study
B2	That the students know how to apply its knowledge to its work or vocation in a professional way and possess the competences that tend to prove itself by the elaboration and defense of arguments and the resolution of problems in its area of study
B3	That the students have the ability to bring together and to interpret relevant data (normally in its area of study) to emit judgments that include a reflection on relevant subjects of social, scientific or ethical kind
B4	That the students can transmit information, ideas, problems and solutions to a public as much specialized as not specialized
B5	That the students developed those skills of learning necessary to start subsequent studies with a high degree of autonomy
B6	Be able to carrying out a critical analysis, evaluation and synthesis of new and complex ideas.
C1	Using the basic tools of the technologies of the information and the communications (TIC) necessary for the exercise of its profession and for the learning throughout its life.

C2	Coming across for the exercise of a, cultivated open citizenship, awkward, democratic and supportive criticism, capable of analyzing the reality, diagnosing problems, formulating and implanting solutions based on the knowledge and orientated to the common good.
C5	Assuming the importance of the learning as professional and as citizen throughout the life.
C6	Recognizing the importance that has the research, the innovation and the technological development in the socioeconomic and cultural advance of the society.

Learning outcomes			
Learning outcomes		Study programme competences	
Have a capacity so that it understands and applies the beginnings of basic knowledge of the general chemist, organic and inorganic chemistry and its applications in the engineering		A4	
That the students know how to apply its knowledge to its work or vocation in a professional way and possess the competences that tend to prove itself by the elaboration and defense of arguments and the resolution of problems in its area of study			B2
That the students have the ability to bring together and to interpret relevant data (normally in its area of study) to emit judgments that include a reflection on relevant subjects of social, scientific or ethical kind			B3
That the students can transmit information, ideas, problems and solutions to a public as much specialized as not specialized			B4
That the students developed those skills of learning necessary to start subsequent studies with a high degree of autonomy			B5
Be able to carrying out a critical analysis, evaluation and synthesis of new and complex ideas.			B6
Que os estudantes demostren posuír e comprender coñecementos nunha área de estudo que parte da base da educación secundaria xeral e adoita encontrarse a un nivel que, aínda que se apoia en libros de texto avanzados, inclúe tamén algúns aspectos que implican coñecementos procedentes da vangarda do seu campo de estudo			B1
Desenvolverse para o exercicio dunha cidadanía aberta, culta, crítica, comprometida, democrática e solidaria, capaz de analizar a realidade, diagnosticar problemas, formular e implantar solucións baseadas no coñecemento e orientadas ao ben común			C2
Asumir como profesionais e cidadáns a importancia da aprendizaxe ao longo da vida			C5
Valorar a importancia da investigación, a innovación e o desenvolvemento tecnolóxico no avance socioeconómico e cultural da sociedade			C6
Utilizar as ferramentas básicas das tecnoloxías da información e as comunicacións (TIC) necesarias para o exercicio da profesión e para a aprendizaxe ao longo da vida			C1

Contents	
Topic	Sub-topic
1. Fundamental Chemical Concepts.	<ul style="list-style-type: none"> <li>- Stoichiometry. Percent Yield of a Reaction. Limiting Reactant.</li> <li>- Atom. Quantum Theory.</li> <li>- Periodic table and Periodic Properties.</li> <li>- Chemical Bonding. Types of Bonding: Ionic, Covalent, Metallic. Intermolecular strengths.</li> </ul>
2. Thermochemistry.	<ul style="list-style-type: none"> <li>- Changes of Energy in the Chemical Reactions.</li> <li>- Enthalpy.</li> <li>- Calorimetry.</li> <li>- Introduction to the Thermodynamics.</li> </ul>
5. Electrochemistry I.	<ul style="list-style-type: none"> <li>- Redox Reactions. Balance of Redox Reactions.</li> <li>- Standard Electrode Potentials.</li> <li>- Spontaneity of the Redox Reactions.</li> <li>- Nernst Equation.</li> </ul>
8. Organic Chemistry.	<ul style="list-style-type: none"> <li>- Introduction to Organic Chemistry.</li> <li>- Functional Groups.</li> <li>- Nomenclature.</li> <li>- Isomery.</li> <li>- General Types of Organic Reactions.</li> </ul>



LABORATORY PRACTICE	<ul style="list-style-type: none"><li>- Heat of Reaction.</li><li>- Acids and Bases.</li><li>- Determination of the Content of Copper in an Alloy.</li><li>- Electrodeposition.</li><li>- Redox Reactions.</li><li>- Polymers.</li></ul>
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Planning				
Methodologies / tests	Competencies	Ordinary class hours	Student's personal work hours	Total hours
Mixed objective/subjective test	A4 B1 B2 B5 B6	5	5	10
Guest lecture / keynote speech	A4 B2 B5 B6 C5	27	27	54
Problem solving	A4 B1 B2 B3 B4 B5 B6	20	20	40
Supervised projects	A4 B1 B2 B3 B4 B5 B6 C1 C2 C6	3	18	21
Laboratory practice	A4 B1 B2 B3 B4 B5 B6 C6	10	10	20
Personalized attention		5	0	5
(*)The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.				

Methodologies	
Methodologies	Description
Mixed objective/subjective test	Written proof used for the evaluation of the learning of the student.
Guest lecture / keynote speech	The teacher will present the fundamental contents of each of the topics. For better learning, students will have to advance the development of these sessions teaching materials suitable for your personal preparation. All students can consult the teacher any aspect of the matter in the tutorial schedule established for this purpose. He taught in large group.
Problem solving	Sessions devoted to the resolution of problems and issues with the active participation of students.
Supervised projects	Realisation of directed studies. Presentation and correction.
Laboratory practice	Comprehensive reading of the practice. The student carries out the experimental work. He poses and resolves the numerical calculations associated as well as the questions that poses him . He examines and values the final result.

Personalized attention	
Methodologies	Description
Laboratory practice Supervised projects	Review of the development of the intermediate stages and final of the directed study.  Resolution of punctual questions that prevent him to follow-up the subject.

Assessment			
Methodologies	Competencies	Description	Qualification
Laboratory practice	A4 B1 B2 B3 B4 B5 B6 C6	It will assess the performance of the prelaboratorios, abilities and skills of students in the experimental work, their ability to interpret the results, etc.	5



Mixed objective/subjective test	A4 B1 B2 B5 B6	In the half of the 1st four-month period, we will realise an eliminatory first partial examination (theory and problems) corresponding to the matter given until this moment. At the end of the 1st four-month period, we will realise a second partial examination (theory and problems) for the students that have surpassed the first partial and a global examination of the subject(theory and problems) for the students that had not presented or had not approved the first partial examination. Each examination will consist of two independent parts, being necessary to obtain a minimum note in each one of them to compensate them: - theory, maximum punctuation 4 points, minimum punctuation to compensate 1,5 points. - Problems, maximum punctuation 3 points, minimum punctuation to compensate 1 points.	70
Problem solving	A4 B1 B2 B3 B4 B5 B6	Some short tests will be done periodically to assess the evolution of the student.	15
Supervised projects	A4 B1 B2 B3 B4 B5 B6 C1 C2 C6	Realisation of three directed activities. Interest and attitude of the student.	10

## Assessment comments

- To be able to add the points of the different activities to the note of the examination, it will be necessary to reach in this a minimum of 3 points.
- To make the examination, students have to make all the laboratory practice,- Students have to make all the laboratory practice to pass the subject.- Those students that have realised and surpassed the laboratory practice of the subject in previous courses, will be able to decide if they do them again or not. In case of not repeating them, the qualification obtained will keep them.- The corresponding qualification to the realisation of supervised projects does not keep from a course to another one.

## Sources of information

<b>Basic</b>	<ul style="list-style-type: none"> <li>- Pérez Iglesias J. y Seco Lago H.M. (2006). Experimentos de Química: Aplicaciones a la Vida Cotidiana. Mc Graw-Hill Calamonte (Badajoz), Filarias</li> <li>- Vinagre F. y Vázquez de Miguel L.M. (1996). Fundamentos y Problemas de Química, 2ª edición. Alianza</li> <li>- <a href="http://eup.cdf.udc.es">http://eup.cdf.udc.es</a> ( ).</li> <li>- Mc Murry, Fay (2009). Química General. Prentice Hall</li> <li>- Chang R. (2010). Química, 10ª edición. Mc Graw-Hill</li> <li>- Petrucci R.H. (2011). Química General: Principios y Aplicaciones Modernas. Prentice Hall</li> </ul>
<b>Complementary</b>	<ul style="list-style-type: none"> <li>- Peterson (1993). Formulación y Nomenclatura Química Inorgánica. EDUNSA</li> <li>- Vale Parapar, Fernández Pereira y otros (2004). Problemas Resueltos de Química para Ingeniería. Thomson</li> <li>- Paz M., Castro F. y Miró J. (1995). Química. UNED</li> <li>- Kotz, Treichel, Harman (2003). Química y Reactividad Química, 5ª edición. Thomson</li> <li>- Willis (1995). Resolución de Problemas de Química General. Reverté</li> <li>- Rosenberg J., Epstein L. y Krieger P. (2014). Química Schaum. McGraw Hill</li> </ul>

## 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

