		Teachin	g Guide		
	Identifying	g Data			2018/19
Subject (*)	Chemistry		Code	610G02001	
Study programme	Grao en Bioloxía				
		Descr	iptors		
Cycle	Period	Ye	ar	Туре	Credits
Graduate	1st four-month period	Fir	st	Basic training	6
Language	SpanishGalician				
Teaching method	Face-to-face				
Prerequisites					
Department	Química				
Coordinador	Ruiz Bolaños, Isabel		E-mail	isabel.ruiz@udc	.es
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Web				'	
General description	Chemistry in Biology degree is a s	ubject of basic	training with con	tents focusing on some	of the fundamental concepts of
	General Chemistry. Such knowled	ge and skills w	vill establish the e	ssential background for	the students, allowing them to
take up the study of the different branches of biology where the chemical phenomenon is involved.			involved.		

	Study programme competences		
Code	Study programme competences		
A26	Deseñar experimentos, obter información e interpretar os resultados.		
A30	Manexar adecuadamente instrumentación científica.		
A31	Desenvolverse con seguridade nun laboratorio.		
B1	Aprender a aprender.		
B2	Resolver problemas de forma efectiva.		
В3	B3 Aplicar un pensamento crítico, lóxico e creativo.		
B4	Traballar de forma autónoma con iniciativa.		
C1	Expresarse correctamente, tanto de forma oral coma escrita, nas linguas oficiais da comunidade autónoma.		

Learning outcomes			
Learning outcomes	Study	y progra	amme
	COI	mpeten	ces
To learn the most important parts of this discipline: Nomenclature, structure and reactivity of the major organic functional	A26	B1	
groups, and thermochemical, kinetics of chemical reactions, chemical equilibrium, acid-base equilibrium and electrochemistry		В3	
and its importance in biological medium.		B4	
To have sufficient knowledge and experimental skills to use, properly and safely, the most common material and compounds	A26	B1	
in a chemical laboratory.	A30	В3	
	A31	B4	
To be able to solve and explain problems related to the chemistry of functional groups, thermochemistry, kinetics of chemical	A26	B1	
reactions, chemical equilibrium, acid-base equilibrium and electrochemistry, and to interpret the results.		B2	
		В3	
		B4	
Be able to express properly the ideas that have been learnt			C1

Contents	
Topic	Sub-topic

1. Organia Chemistry	2 Introduction to Organia Chamietry
Organic Chemistry	? Introduction to Organic Chemistry
	? Alkanes
	? Alkenes and alkynes
	? Aromatic hydrocarbons
	? Alkyl halides
	? Alcohols, fenols and ethers
	? Aldehydes and ketones
	? Carboxylic acids and their derivatives
	? Amines and amides
	? Stereochemistry
2. Thermochemistry	? Concepts and basic terms in Thermochemistry
	? First law of Thermodynamics
	? Heats of reaction. Enthalpy
	? Thermochemical equations
	? Calorimetry
	? Standard enthalpy of formation: Hess's law
	? Spontaneous change and Entropy
	? Second law of Thermodynamics
	? Criteria for spontaneous change. Gibbs's free energy
3. Kinetics and Catalysis	? Definition of kinetics and objectives
	? Variables influencing the rate of chemical reactions
	? Rate of reaction and the rate law
	? Effect of the temperatura on reaction rates. The Arrhenius equation
	? Relationship between kinetic constants and equilibrium constants
	? Theoretical models in chemical kinetics
	? Mechanisms of reacton: elementary processes and in steps
	? Catalysis
4. Chemical equilibrium	? Chemical equilibrium
·	? The equilibrium constant expression
	? Relationship between kinetics and equilibrium
	? Altering equilibrium conditions: Le Chatelier's principle
	? Relationship between the equilibrium constant and Gibbs's free energy
	? Standard state in Biochemistry
	? Coupling reactions in biological systems
5. Acid-base equilibrium	? Acid and base definitions. The Brønsted-Lowry's theory
o. Nota base equilibrium	? Acid-base properties of water: concept of pH
	? Strong and weak acids and bases. Ionization constants
	? Solutions of salts: hydrolysis
	? Solutions of saits. hydrolysis ? The common-ion effect
	? Buffer solutions
	? Acid-base titrations. Acid-base indicators
	? pH control in biological systems

6. Electrochemistry	? Electrochemical processes and redox reactions
	? Chemical energy and Electrochemistry. Electrochemical cells
	? Standard electrode potentials
	? Thermodynamics of electrochemical reactions
	? Effect of the concentration on cell potential
	? pH measurement
	? Membrane potential
	? Redox systems involving protons
	? Redox indicators

	Planning			
Methodologies / tests	Competencies	Competencies Ordinary class		Total hours
		hours	work hours	
Introductory activities	B1	1	0	1
Guest lecture / keynote speech	B1 B3	13	26	39
Seminar	B1 B2 B3 B4	10	30	40
Laboratory practice	A26 A30 A31 B1 B2	15	15	30
	B3 B4 C1			
Supervised projects	A26 B1 B2 B3 B4	8	20	28
Objective test	A26 B1 B2 B3 B4 C1	3	9	12
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
Introductory activities	Initial session to introduce the subject, where students will be informed about the content that is intended to cover, the
	teaching methodology, for large and small groups, and the assessment criteria.
Guest lecture /	The theoretical content will be discussed at the keynote sessions, through multimedia presentations given by the teaching
keynote speech	staff. This presentations, covering the basic content and additional material, will be available for the students at the Moodle
	platform.
Seminar	The seminars will address the analysis and resolution of some of the previously proposed exercises. In order to make the most
	of these sessions, it is very important that students work the exercises prior to their resolution in the classroom. The proposed
	exercices, and the data tables, will be available in advance at the Moodle platform.
Laboratory practice	The students will performe seven lab practices related to the fundamental contents of the subject. The lab sessions will last
	two hours each. The scripts for the practices include the experimental procedure and some related questions. At the end of the
	sessions the students must submit an individual written report collecting the lab work, observations, results, and answers to
	proposed questions.
Supervised projects	In these sessions the understanding of the issues by the students will be assessed. Four sessions are scheduled in reduced
	groups. Students must prepare them, studying the relevant content of the issues. In each session the students first will have to
	do some exercises in groups of 2 or 3 people, which will be solved afterwards. In the last 30 minutes the students will answer
	a questionnaire individualy. Both exercises will be part of the evaluation.
Objective test	The degree of concepts assimilation and problem solving skills of the students will be assessed by mean a written exam.

	Personalized attention	
Methodologies Description		



Supervised projects	In addition to the follow-up work in group tutoring sessions, there will be individual tutoring in the schedule set by the teachers.
	Students with appreciation a part-time academic and attendance waiver of exemption may complete the supervised projects in
	individual and/or group tutoring schedule to be agreed with the teachers.

		Assessment	
Methodologies	Competencies	Description	Qualification
Laboratory practice	A26 A30 A31 B1 B2 B3 B4 C1	The score of the practices represents 20% of the overall score. The submitted report, the attitude and the work done in the lab will be assessed. To pass the subject is necessary to obtain a minimum score of 4 in this part.	20
Supervised projects	A26 B1 B2 B3 B4	The score of the supervised work represents 20% of the overall score.	20
Objective test	A26 B1 B2 B3 B4 C1	The objective test consist of a number of practical or theoretical-practical exercises, similar to those made in seminars and tutorials. To pass the subject is necessary to obtain a minimum score of 4 in this part.	60

Assessment comments

To pass the subject is necessary to obtain a higher or equal to 5 points overall rating (out of 10) in one of the two calls (January and July). A score below 4 on the objective test or laboratory practices implies failing the subject.

The completion of the labs is mandatory to pass the subject. In the first and second opportunities, students who failed the lab practices could undergo a specific test related to the lab practices. The qualification of this specific test will replace the grade obtained in lab practices.

Students who haven't participated in the supervised works will receive a score of 0 in this section, both in January and July calls. Students passing the supervised works section will mantain the obtained rating in case of to attend to the second call.

In the case of students with recognition of part-time dedication and academic assistance waiver, the qualification of the tutored work will be replaced by that obtained in the personal tutorials, with 20% of the overall grade in the first and the second opportunities. In the case of exceptional, objectified and appropriately justified circumstances, the professor may fully or partly exempt any student to perform continuous evaluation process. Students who are in this circumstance must pass a specific test that leaves no doubt about achieving das own powers gives material in the two opportunities. Students who attend fewer than 25% of planned academic activities (supervised work and practices), and do not assist to the objective test, will be qualified as "Not presented".

	Sources of information
Basic	- Petrucci, R.H.; Herring, F.G.; Madura, J.D.; Bissonnette, C. (2017). Química general: Principios y aplicaciones
	modernas (11 ^a Ed). Madrid: Pearson
	En xeral, calquera manual de Química Xeral actualizado é axeitado para o estudo da asignatura. Existen edicións
	anteriores do Petrucci (8ª Ed. QX240, 10 Ed. QX-243) e outros libros recomendados a disposición dos alumnos na
	biblioteca.



Complementary

- Chang, R.L.; Goldsby, K.A. (2013). Química (12ª Ed). México: McGraw-Hill
- Atkins, P.; Jones, L. (2012). Principios de Química. Los caminos del descubrimiento (5ª Ed). Madrid: Ed. Médica Panamericana
- Reboiras, M. D. (2007). Química, La ciencia básica. Madrid: Thomson
- Brown, T.L.; LeMay Jr. H.E.; Bursten, B.E.; Murphy, C.J.; Woodward, P.M. (2014). Química. La ciencia central (12ª Ed). México: Pearson
- Reboiras, M. D. (2007). Problemas resueltos de: Química, la ciencia básica. Madrid: Thomson
- Paterno Parsi, A.; Parsi, A.; Pintauer, T.; Gelmini, L.; Hilts, R. W. (2011). Complete Solutions Manual: General Chemistry, Principles and Modern Applications. Scarbough: Pearson Canada
- Paterno Parsi, A.; Parsi, A.; Pintauer, T.; Gelmini, L.; Hilts, R. W. (2011). Selected Solutions Manual: General Chemistry, Principles and Modern Applications. Toronto: Pearson
- López Cancio, J. A. (2010). Problemas de Química. Madrid: Prentice Hall
 López Cancio, J. A. (2010). Problemas de Química. Madrid: Prentice Hall

	Recommendations
	Subjects that it is recommended to have taken before
	Subjects that are recommended to be taken simultaneously
Mathematics/610G02003	
	Subjects that continue the syllabus
Biochemistry I/610G02011	
Biochemistry II/610G02012	
	Other comments

Other comments

In order to successfully study the subject, it is imperative that the student has a previous knowledge of chemistry and mathematics, according to the level in secondary and high school, such as: Chemical nomenclature, balance of chemical reactions, Stoichiometric calculations, identification of acid-base character of common compounds, obtaining oxidation states of elements in chemical species, logarithms, exponents and differential and integral calculus.

(*)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.