



## IDENTIFYING DATA

### Chemistry: Chemistry 2

Subject	Chemistry: Chemistry 2			
Code	V11G201V01109			
Study programme	(*)Grao en Química			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Basic education	1st	2nd
Teaching language	#EnglishFriendly Spanish Galician			
Department				
Coordinator	Pérez Juste, Ignacio			
Lecturers	Estévez Guiance, Laura Pérez Juste, Ignacio			
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Web	<a href="http://quimica.uvigo.es">http://quimica.uvigo.es</a>			
General description	Chemistry 2, taught in the second semester of the first course, belongs to the module of fundamental subjects and pretends to provide to the student the chemical knowledge and skills necessary to successfully continue the learning of Analytical Chemical, Physical Chemistry, Inorganic Chemistry and Organic Chemistry in the following courses.			

## Competencies

Code	
A1	Students have demonstrated knowledge and understanding in a field of study that builds upon their general secondary education, and is typically at a level that, whilst supported by advanced textbooks, includes some aspects that will be informed by knowledge of the forefront of their field of study
B1	Autonomous learning ability
B2	Organization and planning capacity
C1	Ability to know and understand essential facts, concepts, principles and theories related to Chemistry
C2	Use correctly chemical terminology, nomenclature, conversions and units
C11	Know the principles of Thermodynamics and its applications in Chemistry
C12	Know the kinetics of chemical change, including catalysis and reaction mechanisms
D1	Ability to solve problems

## Learning outcomes

Expected results from this subject	Training and Learning Results			
Identify the properties of electrolyte and non-electrolyte solutions	A1	B1 B2	C1 C2	D1
Determine the variations of thermodynamic magnitudes in chemical reactions	A1	B1 B2	C2 C11	D1
Interpret and recognise the concepts of chemical equilibrium and, in particular, those corresponding to chemical equilibrium in aqueous solution	A1	B1 B2	C1 C11	D1
Calculate the kinetical parameters of simple reactions	A1	B1 B2	C1 C12	

## Contents

Topic	
1. SOLUTIONS	General properties. Expressing the concentration. Solubility: Henry's Law. Colligative properties.
2. THERMODYNAMICS	First law of thermodynamics. Calorimetry. Standard states. Thermochemistry. Entropy. Second law of thermodynamic Spontaneity of chemical processes.

3. CHEMICAL EQUILIBRIUM	The concept of equilibrium and the equilibrium constant. Factors that affect chemical equilibrium, Variation of the equilibrium constant with temperature.
4. ACIDS AND BASES	Definitions of acids and bases. Acid-base equilibria. Concept of pH. Hydrolysis. Buffer solutions. Indicators. Titrations.
5. SOLUBILITY	Solubility equilibrium and the solubility product constant. The common ion effect. Effect of pH. Complex ion equilibria.
6. ELECTROCHEMISTRY	Redox reactions. Electrochemical cells. Electrode potential. Nernst equation. Corrosion. Electrolysis.
7. CHEMICAL KINETICS	Rate of a chemical reaction. Rate law. The effect of temperature on reactions rates. Reaction mechanisms. Catalysis. Nuclear chemistry.

### Planning

	Class hours	Hours outside the classroom	Total hours
Lecturing	26	0	26
Problem solving	26	0	26
Essay questions exam	2	66	68
Problem and/or exercise solving	0	20	20
Objective questions exam	0	10	10

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

### Methodologies

	Description
Lecturing	Presentation by the teacher of the contents of the subject, their theoretical basis and/or the guidelines of the work that must be developed by the students. This methodology also includes some Introductory Activities: Activities to take contact and gather information about the students and to present them the subject.
Problem solving	Students have to solve problems by using routines, application of formulas or algorithms, use of transformation procedures of the available information and the interpretation of the results. This activity is complementary of the theoretical lectures and allows to deepen or complement the contents of the subject.

### Personalized assistance

Methodologies	Description
Lecturing	During office hours, students can present individually to their teachers the doubts that arise along the course in the theoretical classes, the seminar sessions or during their autonomous activities. The aim of these office hours is to help students to reinforce their knowledge so that they can face in better conditions to evaluation activities proposed (written exams, problems resolution and/or quiz tests).
Problem solving	During office hours, students can present individually to their teachers the doubts that arise along the course in the theoretical classes, the seminar sessions or during their autonomous activities. The aim of these office hours is to help students to reinforce their knowledge so that they can face in better conditions to evaluation activities proposed (written exams, problems resolution and/or quiz tests).
Tests	Description
Essay questions exam	During office hours, students can present individually to their teachers the doubts that arise along the course in the theoretical classes, the seminar sessions or during their autonomous activities. The aim of these office hours is to help students to reinforce their knowledge so that they can face in better conditions to evaluation activities proposed (written exams, problems resolution and/or quiz tests).
Problem and/or exercise solving	During office hours, students can present individually to their teachers the doubts that arise along the course in the theoretical classes, the seminar sessions or during their autonomous activities. The aim of these office hours is to help students to reinforce their knowledge so that they can face in better conditions to evaluation activities proposed (written exams, problems resolution and/or quiz tests).
Objective questions exam	During office hours, students can present individually to their teachers the doubts that arise along the course in the theoretical classes, the seminar sessions or during their autonomous activities. The aim of these office hours is to help students to reinforce their knowledge so that they can face in better conditions to evaluation activities proposed (written exams, problems resolution and/or quiz tests).

### Assessment

	Description	Qualification	Training and Learning Results		
Essay questions exam	<p>1.- Around mid-term, there will be a written exam about the contents taught until then. The grade for this exam will suppose the first-half of the grade corresponding to the written exams. Obtaining a minimum grade of 5 out of 10 will exclude these contents in the final exam.</p> <p>2.- At the end of the semester, there will be a final written exam with the following conditions:</p> <p>a) If the first written exam is passed, only the second part of the contents will be included in the final written exam. The grade obtained of this exam will suppose the second half of the grade corresponding to the written exams.</p> <p>b) If the first written exam is failed, all the contents of the subject will be included in the final written exam. The grade for this exam will suppose all the grade corresponding to the written exams. To pass the subject, a minimum grade of 5 out of 10 has to be obtained in the final written exam.</p>	Mínimo 70	A1	C2 C11 C12	D1
Problem and/or exercise solving	<p>For each part of the subject, problems will be proposed to the students to be individually solved in seminar classes or as homework. The grade obtained in this section will be considered only if half of these activities are done and if a minimum grade of 4 out of 10 is obtained in the written exams.</p>	Máximo 15	A1	B1 B2 C1 C2 C11 C12	D1
Objective questions exam	<p>For each part of the subject, multiple choice tests (through TEMA) will be proposed to the students. The grade obtained in this section will be considered only if half of these activities is done and if a minimum grade of 4 out of 10 is obtained in the written exams.</p>	Máximo 15	A1	B1 B2 C2 C11 C12	

### Other comments on the Evaluation

- The dates of the written exams are published in the calendar of academical activities of the Faculty of Chemistry.
- Attending at one of the written exams is the minimum condition to be graded.
- In the following examination calls, the students will maintain the grades obtained for individual work, except in the case of a change of professor, who can set new rules for the subject.

### Sources of information

#### Basic Bibliography

Ralph H. Petrucci; F. Geoffrey Herring; Jeffry D. Madura; Carey Bissonnette, **Química General**, 10, Pearson Educación, 2011  
Raymond Chang, Kenneth Goldsby, **Química**, 12, McGraw-Hill, 2016  
Kenneth W. Whitten, Raymond E. Davis, M. Larry Peck, George G. Stanley, **Química**, 10, Cengage Learning, 2015  
Theodore L. Brown, **Química. La ciencia central**, 12, Pearson Educación, 2014

#### Complementary Bibliography

Peter Atkins, Loretta Jones, **Principios de química. Los caminos del descubrimiento**, 5, Médica Panamericana, 2012  
José Antonio López Cancio, **Problemas de química**, 1, Prentice Hall, 2000

### Recommendations

#### Subjects that are recommended to be taken simultaneously

Physics: Physics 2/V11G201V01107  
Geology: Geology/V11G201V01106  
Mathematics: Mathematics 2/V11G201V01108  
Chemistry: Chemistry Lab II/V11G201V01110

#### Subjects that it is recommended to have taken before

Chemistry: Chemistry Lab I/V11G201V01105  
Chemistry: Chemistry 1/V11G201V01104

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## Contingency plan

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### Description

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=== EXCEPTIONAL PLANNING ===

Given the uncertain and unpredictable evolution of the health alert caused by COVID-19, the University of Vigo establishes an extraordinary planning that will be activated when the administrations and the institution itself determine it, considering safety, health and responsibility criteria both in distance and blended learning. These already planned measures guarantee, at the required time, the development of teaching in a more agile and effective way, as it is known in advance (or well in advance) by the students and teachers through the standardized tool.

=== CHEMISTRY II: ADAPTATION OF THE METHODOLOGIES AND THE EVALUATION ===

For this, the lectures and seminar sessions will be carried out through a combination of interactive sessions through the Remote Campus and videos, animations and multimedia resources specifically prepared with the subject contents. This combination will be organized in a way that allows students to organize the work to be done autonomously, in anticipation of problems of connectivity or family reconciliation.

On the other hand, the evaluation of the subject will be carried out using the tools available on the FAITIC platform.

Individual tutoring will be carried out by telematic means (email, videoconference at the Remote Campus, FAITIC forums, ...).

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