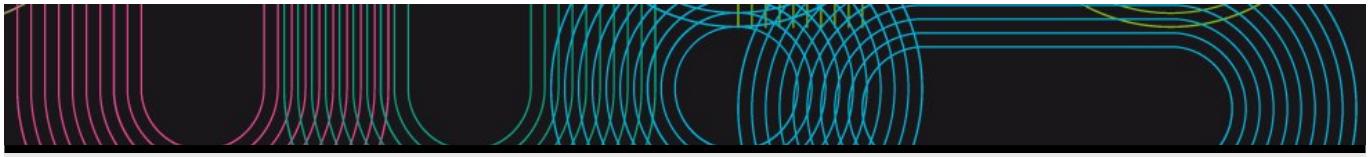

IDENTIFYING DATA				
Chemistry: Chemistry 2				
Subject	Chemistry: Chemistry 2			
Code	V11G201V01109			
Study programme	Grado en Química			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Basic education	1st	2nd
Teaching language	#EnglishFriendly Spanish Galician			
Department				
Coordinator	Pérez Juste, Ignacio			
Lecturers	Losada Barreiro, Sonia Pérez Juste, Ignacio			
E-mail	uviqpipj@uvigo.es			
Web	http://quimica.uvigo.es			
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. ========== English Friendly subject: International students may request from the teachers: a) materials and bibliographic references in English, b) tutoring sessions in English, c) exams and assessments in English			

Training and Learning Results	
Code	
A2	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	Ability for auronomous learning
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

Expected results from this subject	Training and Learning Results			
Identify the properties of electrolyte and non-electrolyte solutions	A2	B1 B2	C1 C2	D1
Determine the variations of thermodynamic magnitudes in chemical reactions	A2	B1 B2	C2 C11	D1
Interpret and recognise the concepts of chemical equlibrium and, in particular, those corresponding to chemical equilibrium in aqueous solution	A2	B1 B2	C1 C11	D1
Calculate the kinetical parameters of simple reactions	A2	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 equilibrum constant with temperature.
4. ACIDS AND BASES	Definitions of acids and bases. Acid-base equlibria. Concept of pH. Hydrolysis. Buffer solutions. Indicators. Titrations.
5. SOLUBILITY	Solubillity 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
Seminars	26	0	26
Essay questions exam	1	33	34
Essay questions exam	1	33	34
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.
Seminars	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).
Seminars	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**
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	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.	Mínimo 35	A2		C2 C11 C12	D1
Essay questions exam	2.- At the end of the semester, there will be a final written exam with the following conditions: 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. 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.	Mínimo 35	A2	B1 B2	C2 C11 C12	D1
Problem and/or exercise solving	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.	Máximo 15	A2	B1 B2	C1 C2 C11 C12	D1
Objective questions exam	For each part of the subject, multiple choice tests (through MOOVI) 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.	Máximo 15	A2	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 mininum 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