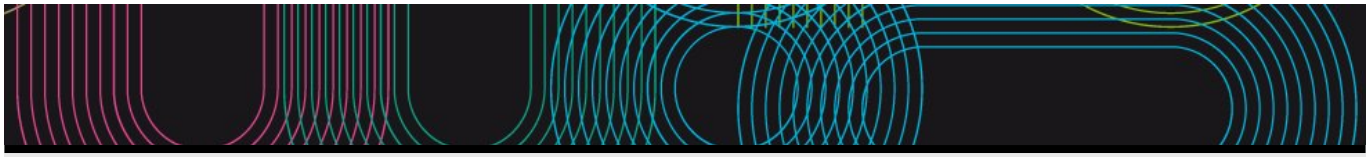

IDENTIFYING DATA				
Chemistry: Chemistry I				
Subject	Chemistry: Chemistry I			
Code	V10G061V01105			
Study programme	Grado en Ciencias del Mar			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Basic education	1st	1st
Teaching language	#EnglishFriendly Spanish Galician			
Department				
Coordinator	Estévez Guiance, Laura			
Lecturers	Alonso Gómez, José Lorenzo Hermida Ramón, José Manuel Losada Barreiro, Sonia Pérez Lorenzo, Moisés			
E-mail	lestevez@uvigo.es			
Web				
General description	The subjet Chemical I enters the students of first course of the Degree in Marine Sciences in the basic concepts of the intermolecular interactions, the chemical thermodynamics, the chemical equilibria, the chemical kinetics and a introduction to the chemical reactivity and to the organic chemistry. English Friendly subject: International students may request from the teachers: a) resources and bibliographic references in English, b) tutoring sessions in English, c) exams and assessments in English.			

Training and Learning Results	
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
A5	Students have developed those learning skills that are necessary for them to continue to undertake further study with a high degree of autonomy
B3	Recognize and implement good practices in measurement and experimentation, and work responsibly and safely both in field surveys and in the laboratory.
B4	Manage, process and interpret the data and information obtained both in the field and in the laboratory.
C1	know at a general level the fundamental principles of sciences: Mathematics, Physics, Chemistry, Biology and Geology.
C6	Acquire the fundamentals and terminology of chemical processes.
D1	Develop the search, analysis and synthesis of information skills oriented to the identification and resolution of problems.
D2	Acquire the ability to learn autonomously, continuously and collaboratively, organizing and planning tasks over time.

Expected results from this subject	Training and Learning Results			
- Chemical Nomenclature.	A1 A5	B4	C1 C6	D1 D2
- Achieve the basic rules of laboratory working, as well as the risks associated to handle dangerous chemical substances.	A5	B3 B4	C6	D1 D2
- Calculation of concentrations of solutions.	A1 A5			
- Identify chemical reactions of interest in the marine medium.	A1 A5			

- To predict the properties of substances in function of the present intermolecular forces.	A1 A5
- Definition of concepts such entalphy, standard entalphy, calorimetry, heat of dissolution and heat of reaction, and their calculation.	A1 A5
- Know how to use the expressions of the chemical balances to calculate the distribution of the substances involved in them. Know the factors that affect the balance and use the Le Chatelier principle.	A1 A5
- Definition of pH and pOH, acidity/basicity constant, constants, hidrólisis constnt, and their calculatión.	A1 A5
- Learn about buffer solutions and the different types of acid-base reactions and know how to use them.	A1 A5
- Definition of concepts such solubility and product of solubility, and know as if they calculate.	A1 A5
- To know what a oxidation-reduction process is, to define REDOX potential, standard potentials, and to know how they are calculated.	A1 A5
- Understand the principles of operation of an electrochemical cell and predict the products of a electrochemical.	A1 A5
- To define reaction rate and rate equation, and know how to use.	A1 A5
- Learn and know how to use the main methods of analysis of kinetic data.	A1 A5
- To calculate the effect of the temperature in the reaction rate.	A1 A5
- To know the general characteristics of catalysis and their types.	A1 A5
- Differentiate between chemically-controlled reactions and diffusion-controlled reactions.	A1 A5
- Know the functional groups describing the structure of the organic molecules and their reactivity.	A1 A5

Contents

Topic	
Thermochemistry	Internal energy. Heat, work and first principle of thermodynamics. Enthalpy, standard enthalpy. Measure of heats of reaction: Calorimetry. Entropy and Gibbs energ.
Chemical Equilibrium in Gas Systems	Chemical equilibrium. Equilibrium constant. Temperature dependence of equilibrium constant. Altering equilibrium: Le Châtelier principle.
Acid- Base Equilibrium	Theories of acids and bases. Scale of pH. Strong and weak acids and bases. Acid-base Equilibrium. Reactions of hydrolisys. Buffer solutions. Acid-Base reactions. Acid-Base titrations.
Solubility Equilibrium	Solubility and solubility product constant. Altering solubility equilibrium: Common-ion effect. Equilibria involving complex ions.
Redox Processes	Adjustment of redox equations. Redox Equilibrium. Thermodynamics of redox reactions: The Nernst equation. Standard electrode potentials. Galvanic cells. Electrolytic cells
Chemical Kinetics	Reaction rate. Rate equation. Analysis of kinetic data. The effect of the temperature on reaction rates. Catalysis.
Intermolecular Forces	Molecular geometry and polarity. Types of intermolecular forces: Electrostatic forces, inductive forces, dispersion forces, hydrogen bonding. Some properties of liquids.
Introduction to Organic Chemistry	Functional groups. Structure and reactivity. Basic stereochemistry: chirality and configurational stereochemistry.
Laboratory Practices	Application of the experimental techniques related to the subjet. Implementation in the laboratory of the knowledge acquired in themes of thermochemistry, chemical equilibrium and chemical kinetics.

Planning

	Class hours	Hours outside the classroom	Total hours
Lecturing	26	0	26
Seminars	14	20	34
Laboratory practical	12	12	24
Essay questions exam	0	18	18
Objective questions exam	0	10	10
Essay questions exam	0	38	38

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

Methodologies	
	Description
Lecturing	They will consist of the exposition of the fundamental aspects of each topic by the teacher, based on the material available on the e-learning platform. In addition to the exposition of topics, numerical problems will also be formulated to help to understand and establish the concepts.
Seminars	The seminar classes will be devoted primarily to problem solving and, when necessary, to delve into the aspects of the topics that present greater difficulties to the students. In the seminar sessions, the teacher may propose problems or exercises that the students must solve individually and submit to the teacher for evaluation. Attendance will be positively valued.
Laboratory practical	Performance, under the supervision of the teacher but autonomously, of laboratory practices related to the subject. The practices will be carried out in pairs. Before starting, the students will have, in the corresponding platform, the scripts of the practices. The script will present the essential elements to carry out the practice at experimental level, as well as the basic points of its theoretical basis and data processing. At the end of the practicals, an evaluation will be carried out by means of a written test, delivery of a report and/or oral test according to the teacher's criteria. Attendance to the practical sessions IS MANDATORY.

Personalized assistance	
Methodologies	**Description**
Lecturing	Those doubts/questions of the students that may arise along the course concerning the classes of theory will be solved in the tutoring schedule. The preferential modality for the tutoring will be a mixed model decided by the student and teacher. The student will have to request an appointment with the professor to arrange the date, hour, and method (virtually or on-site).
Laboratory practical	Those doubts/questions of the students that may arise along the course concerning the laboratory practices or the preparation of the corresponding reports will be solved in the tutoring schedule. The preferential modality for the tutoring will be a mixed model decided by the student and teacher. The student will have to request an appointment with the professor to arrange the date, hour, and method (virtually or on-site).

Assessment						
	Description	Qualification	Training and Learning Results			
Seminars	For each subject or block of subjects, the estudiantado, of individual form, will resolve a problem or exercise, to proposal of the *profesorado, that will deliver to be evaluated. It will value the assistance.	15	A1 A5		C1 C6	D1 D2
Laboratory practical	It marks here together with the effort and the attitude, the skills and the competitions developed by the student during the realisation of the distinct practical. The assistance the sessions of practices is compulsory and, therefore, is not possible to approve the matter in the case of not to have made. - It remains to criterion of the educational make an evaluation by means of an oral proof and/or written the last day of practices.	15	A1 A5	B3 B4	C1 C6	D1 D2
Essay questions exam	First test. The date of the test will be agreed with the students, as far as possible, but always after the completion of topic 2. The evaluation will be based on theory questions and the resolution of exercises.	15	A1 A5		C1 C6	D1 D2
Objective questions exam	Self-assessment tests that students must solve individually, through the MOOVI platform.	15	A1 A5		C1 C6	D1 D2
Essay questions exam	Second test to be taken on the date of the official exam. The contents evaluated will be all the contents of the subject. The evaluation will be based on theory questions and the resolution of exercises.	40	A1 A5		C1 C6	D1 D2

Other comments on the Evaluation
In order to pass the subject, **it is essential to attend the practical sessions and to achieve a minimum grade of 5.0 points out of 10 in the second test**. If this score is not reached, the grade that will be reflected in the minutes will be only the grade of this exam, not counting any of the other sections. The overall grade will be the weighted sum of the tests (55%), the laboratory practices (15%), the self-evaluation tests (15%) and the Seminars (15%). The computation of the evaluable methodologies: laboratory practices (15%), self-evaluation test (15%) and Seminar (15%) will be effective as long as a minimum score of 3.5 points is obtained in each of them.

The completion of any evaluable test will imply the condition of "presented" and, therefore, the assignment of a grade according to what is stated in this teaching guide.

Second Round:

For the evaluation in the second call, the percentages of the laboratory practices, tests and Seminar will be maintained. The exam in this call will be weighted 55%. In order to pass the subject in this call, it will be necessary to obtain a minimum qualification of 5.0 points out of 10 in the exam, in which all the contents of the subject will be evaluated.

Global assessment option

The application for this evaluation option must be submitted in the time and manner determined by the Center, which will be published prior to the academic start. Given the experimental nature of the practices, attendance at them is mandatory to be eligible for this evaluation option. Failure to attend the practices, with no justified cause invalidates this possibility, as well as the opportunity for extraordinary evaluation (2nd opportunity). To pass the subject, they must complete and pass the Laboratory Classes evaluation (15% of the final mark) with a score equal to or greater than 4.0 points over 10. In addition, they must achieve at least 5.0 points out of 10, in a test on all the contents of the subject, which will account for 85% of the final mark, both in the ordinary and in the extraordinary opportunity.

Other considerations:

It considers inadmissible any form of fraud (i.e. copies and/or plagiarism) directed to *falsear the level of knowledge or skill reached in any type of proof, report or work. The fraudulent behaviours will be able to suppose suspend the matter during a complete course. It will carry an internal register of these performances for, in case of *reincidencia, request to the rectorship the opening of a disciplinary file.

Sources of information

Basic Bibliography

PETRUCCI R.H., **Química General**, (11ª edición), Ed. Pearson Educación, 2017
CHANG, R., GOLDSBY, K. A., **Química**, (12ª edición), Ed. McGraw-Hill, 2016

Complementary Bibliography

LÓPEZ CANCIO, J.A., **Problemas de química**, (1ª edición), Ed. Prentice-Hall, 2000
Peter Atkins, Loretta Jones, **Química. La ciencia central**, (12ª edición), Pearson Educación, 2014
RILEY, J.P., CHESTER, R., **"Introducción a la Química Marina"**, (1ª edición), Ed. A.G.T, 1989

Recommendations

Subjects that continue the syllabus

Chemistry: Chemistry 2/V10G061V01110

Subjects that are recommended to be taken simultaneously

Physics: Physics I/V10G061V01102
Mathematics: Mathematics I/V10G061V01104

Other comments

Stoichiometry, basic laws , different forms to express the concentration and basic chemical nomenclatura will be used very often resolving numerical problems and can be considered fundamental tools in this subject.