UAB
Universitat Autònoma de Barcelona

Chemistry

Code: 107947
ECTS Credits: 4

2025/2026

Degree	Type	Year
Environmental Biology	OB	1

Contact

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Teaching groups languages

You can view this information at the end of this document.

Prerequisites

There are no official prerequisites. However, it is assumed that the student has acquired the basic knowledge taught in the Chemistry and Technology and / or Experimental subjects of the baccalaureate.

Objectives and Contextualisation

In the subject Chemistry, concepts in the Inorganic Chemistry area, such as the atomic structure, the periodic table and the chemical bond, are studied in a first part, introducing the concept of Stoichiometry of compounds and reactions . We continue talking about the aggregation states of the matter, emphasizing dissolutions. Concepts of thermodynamics and chemical kinetics are introduced. In a second part, the section of dissolutions is extended by talking about the concept of chemical equilibrium, in the area of Analytical Chemistry, mentioning the main balances to be considered in aqueous solution. Finally, the last part of the subject will refer to a brief introduction to Organic Chemistry and Stereochemistry.

The general objective of the subject is to provide the basics of the basic aspects and concepts in Chemistry necessary for the follow-up of different subjects of the Degree in Environmental Biology.

Specific objectives of the subject:

Understand the fundamental concepts in chemistry: atomic structure, chemical bonding, and stoichiometry.
Understand the concepts of Thermodynamics and Kinetics of chemical reactions.
Describe the chemical equilibrium in aqueous solution and know how to get the information timely.
Introduce yourself in the world of Organic and Stereochemistry Chemistry, knowing the formulation and naming of aliphatic and aromatic hydrocarbons.
Learn how to apply the knowledge studied to solve qualitative and quantitative problems.

Learning Outcomes

1. CM01 (Competence) Assess the environmental impact of chemical compounds and processes.
2. KM01 (Knowledge) Relate the work and operating standards of a chemical laboratory.
3. KM02 (Knowledge) Identify chemical equilibrium processes that occur in the chemical bonds of biological systems.

4. KM03 (Knowledge) Identify the functional groups and reactivity of the organic groups present in the biomolecules.
5. KM04 (Knowledge) Identify oxidation and reduction processes in biological systems.
6. SM01 (Skill) Solve basic chemistry problems by applying the laws of chemical equilibrium, as well as the principles of thermodynamics and kinetics to biological processes.
7. SM02 (Skill) Perform basic experiments in chemistry including the preparation of solutions and handling of reagents.

Content

THEORY

The first topics (1 to 4) try to review the previously acquired concepts, between ESO and Baccalaureate.

Topics 1 and 2 are preparatory, meaning students will have access to the teaching and self-study materials necessary to begin the in-person course for topics 3 to 6.

Topic 5 includes chemical equilibria in dissolution, the basis for understanding many of the chemical and biochemical processes in our environment, so it will be an extensive subject, with much of the applied exercises.

Item 6 is a review of organic formulation and nomenclature, extending information relative to the main characteristics of the various types of compounds.

Topic 1. Fundamental concepts: matter, substance and mixture; physical-chemical properties; elements and compounds.

Topic 2. The periodic table. Chemical equations

Subject 3. Chemical link.

Topic 4. Thermodynamic and kinetic bases of balance.

Topic 5. Acid-base equilibria. pH and alkalinity. Oxidation-reduction balances. Solubility balances.

Topic 6. Structures and formulas of organic molecules. Aliphatic and aromatic hydrocarbons. Alcohols, ethers and thiols. The carbonyl group: aldehydes and ketones. The carboxyl group: acids and derivatives. The amino group and derivatives. Organic compounds and toxicity.

PROBLEMS

The content of this section, which will be presented in the form of a dossier at the beginning of the semester, consists of a certain amount of statements of problems related to the topics developed in Theory. The characteristics of the different parts of the Theory's agenda make the statements of these problems concentrate on certain aspects that are: calculations of concentration of dissolution (concentration concept and way of expressing it), conversion factors, and stoichiometric calculations. In the Chemical Balance section, exercises will be related to learn to perform pH calculations of acid-base solutions, determine the presence of soluble coordination compounds (complexation equilibria), determine the oxidizing or reducing capacity in Aqueous solutions (oxidation-reduction equilibrium) as well as determine the solubility of insoluble salts (solubility equilibria) including fractional precipitation concepts (separations of spices). Finally, problems of formulation and nomenclature of organic chemistry will be included in the collection.

LABORATORY PRACTICES

There are two laboratory sessions of three hours each.

Practice 1: SEPARATION AND PURIFICATION OF SOLIDS

Practice 2: DETERMINATION OF THE DURATION OF WATER. DETERMINATION OF CALCIUM AND MAGNESI IN WOMEN OF DOMESTIC CONSUMPTION

Activities and Methodology

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Laboratory practices (PLAB)	6	0.24	CM01, KM01, SM02, CM01
Practical exercices classes (PAUL)	9	0.36	KM02, KM03, KM04, SM01, KM02
Theory classes (TE)	20	0.8	CM01, KM02, KM03, KM04, SM01, CM01
Type: Autonomous			
Resolution of problems and cooperative activities (AC)	21	0.84	KM02, KM03, KM04, SM01, KM02
Study	36	1.44	CM01, KM01, KM02, KM03, KM04, SM01, CM01

The training activities are divided into three sections: theory classes, problem classes and laboratory practices, each one with its specific methodology. These activities will be complemented by a series of tutoring sessions that will be programmed additionally.

Theory classes

The teacher will explain the content of the syllabus with the support of audiovisual material that will be available to students in the Virtual Campus of the subject. These lectures will be the most important part of the theory section.

Under the guidance of the teacher and through communication through the Virtual Campus, the knowledge of selected parts of the syllabus will have to be searched and studied by means of autonomous learning by the students. In order to facilitate this task, information about locations will be provided in textbooks, web pages, etc. This material of autonomous study and other questions / practical problems that may be raised will be, in part, the content of the tutorial sessions.

Also to reinforce learning, cooperative activities will be proposed to be carried out in groups, both inside and outside the classroom. Within the classroom they will be led by the teacher, in some kind of theory. And activities outside the classroom will involve the need to do bibliographic research, as well as to organize properly for teamwork, discussion and sharing of the knowledge acquired by each member of the group.

Problem classes

The group will be divided into two subgroups, whose lists will be made public at the beginning of the year. Students will attend the sessions programmed by their group.

At the beginning of the semester a dossier of statements of problems of the subject will be delivered through the Virtual Campus that will be resolved throughout the sessions. In these sessions distributed throughout the semester, the teacher of problems will present the experimental and calculation principles necessary to work on the problems, explaining the guidelines for their resolution and reinforcing the same time the knowledge of different parts of the subject of the theory classes .

Laboratory practices

The group will be subdivided into two subgroups, whose lists will be announced in advance. It is necessary to appear in practices with a lab coat, the practice protocol (available on the Virtual Campus) printed, and previously read. It will also be necessary to carry a notebook to record the observations made and the data obtained.

On the days set in the calendar, students will be summoned to the chemistry laboratory to carry out basic experiences. The practices will be carried out in pairs, while being evaluated individually. At the end of each session, a test type questionnaire will be required to evaluate the understanding of the related practice, and will present the results of the experiment. Attendance is mandatory.

Tutorials

The schedule of individualized tutorials will be specified with the teacher. If the teacher finds it appropriate in some cases they will do group tutorials in the classroom, at agreed times.

Material available on the Virtual Campus of the subject

Teaching guide

Presentations used by teachers in theory and problem classes

Dossier of problem classes

Protocols of the practical classes

Calendar of teaching activities (classroom, laboratory classes, tutorials, assessments, deliveries ...)

Annotation: Within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

Assessment

Continous Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
First partial exam	35%	3	0.12	CM01, KM02, KM03, KM04, SM01
Questionnaires of Cooperative Activities	20%	0	0	
Questionnaires of Practices	10%	2	0.08	CM01, KM01, KM02, KM03, SM01, SM02
Secon partial exam	35%	3	0.12	CM01, KM02, KM03, KM04, SM01

CONTINUED AVALUATION
The evaluation of the subject will be carried out through a continuous evaluation that will consist of:
1) Presentation of works called Cooperative Activities (AC) that will be carried out in previously defined groups of students. Sending files via Moodle. They must be approved (minimum average grade of 5.0 out of 10) so that they weigh in the final grade, otherwise the subject will be suspended. The average grade of cooperative activities will be 20% of the final grade.
2) Laboratory practices (PLAB) to be carried out in pairs of students. The grade point average will evaluate: questionnaires and/or reports of each practice, attitude and laboratory notebook. They must be approved (minimum average grade of 5.0 out of 10) for them to count in the final grade, otherwise the subject will be

suspended. The average grade of the laboratory practices will be 10% of the final grade.
3a) Two partial exams that will evaluate theory and problems, and that will be carried out individually. The two partials will assess approximately two halves of the syllabus. It is necessary to pass both partials (each with a minimum grade of 5.0 out of 10) so that they weigh in the final grade, otherwise each suspended partial will be replaced by a make-up exam. The grade for each partial exam will be 35% of the final grade.
3b) A recovery exam that will evaluate theory and problems of the part of the syllabus corresponding to the failed partial. This recovery replaces each suspended partial and is not intended to increase the grade when the partial has been approved. Making up the recovery will result in the invalidation of the grade of the suspended partial. You will need to pass the make-up exam (minimum grade of 5.0 out of 10) so that it counts in the final grade, otherwise the subject will be suspended. The grade for the make-up exam will be 35% (for a failed partial) or 2 x 35% (for two failed partials) of the final grade. You can only recover the gradeof the failed partial exams. Grades and weightings for suspended cooperative activities and laboratory practices are not recovered.
To pass the subject you must obtain a minimum final grade of 5.0 points out of 10 in the weighted sum of each of the parts (cooperative activities 20%, laboratory practices 10%, partial exams 2 x 35%).
If the cooperative activities and laboratory practices are not presented, the student will be classified as "not evaluable", regardless of the grade of the partial exams.
To participate in the recovery, students must have previously been assessed in a set of activities whose weight is equivalent to a minimum of two-thirds of the subject's total grade.

Students who do not pass the subject because they do not pass one/several blocks (AC, PLAB and/or exams), regardless of their overall average, will obtain a maximum final grade of 4.5.

UNIQUE ASSESSMENT
Students taking the single assessment must do the following:
1) The presentation of work called Cooperative Activities (AC), does not require attendance and its weight in the final grade is 20%. The files will be sent via Moodle on the day of the single exam that coincides with the date of the second partial exam. They must be approved (minimum average grade of 5.0 out of 10) so that they weigh in the final grade, otherwise the subject will be suspended.
2) Laboratory practices (PLAB) in face-to-face sessions and will have a weight of 10% in the final grade. They must be approved (minimum average grade of 5.0 out of 10) for them to count in the final grade, otherwise the subject will be suspended.
3a) A single exam that will evaluate theory and problems of the entire syllabus, and that will be carried out individually. The day of the single exam coincides with the date of the second partial exam. It is necessary to pass the single exam (minimum grade of 5.0 out of 10) so that it counts in the final grade, otherwise it will be replaced by a recovery exam. The grade of the single exam will be 70% of the final grade.
3b) A recovery exam that will assess theory and problems from the entire syllabus. This retake replaces the failed single exam and is not intended to raise a grade when the single exam is passed. Completing the recovery will result in the invalidation of the grade of the single failed exam. The day of the make-up exam is the same date as the make-up exam of the continuous assessment. The retake must be approved (minimum grade of 5.0 out of 10) so that it counts in the final grade, otherwise the subject will be suspended. The grade of the make-up exam will be 70% of the final grade. You can only recover the grade of the failed exam. The marks and weightings of the written or oral assignments suspended are not recovered.
To pass the subject you must obtain a minimum final grade of 5.0 points out of 10 in the weighted sum of each of the parts (cooperative activities 20%, laboratory practices 10%, single exam 70%).
To participate in the recovery, students must have previously been assessed in a set of activities whose weight is equivalent to a minimum of two-thirds of the subject's total grade.

Students who do not pass the subject because they do not pass one/several blocks (AC, PLAB and/or exams), regardless of their overall average, will obtain a maximum final grade of 4.5.

Bibliography

Bibliography
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W.L.Masterton, C.N. Hurley, chemistry. Principles and Reactions. Editorial Thomson. 4th edition. 2003
Petrucci, Harword, Herring, General Chemistry. Chemical Link and Structure of Matter, Ed. Prentice Hall, 8th edition, 2002
B.H.Mahan, Chemistry. Editorial Addison-Wesley Iberoamericana. 2nd edition. 1986

Web links

Those that are required, will be updated on the Virtual Campus of the subject.

Software

There is no software

Groups and Languages

Please note that this information is provisional until 30 November 2025. You can check it through this link. To consult the language you will need to enter the CODE of the subject.

Name	Group	Language	Semester	Turn
(PAUL) Classroom practices	1	Catalan	first semester	morning-mixed
(PAUL) Classroom practices	2	Catalan	first semester	morning-mixed
(TE) Theory	1	Catalan	first semester	morning-mixed