

**Basic Chemistry I**

Code: 105032  
ECTS Credits: 8

**2024/2025**

Degree	Type	Year
2502444 Chemistry	FB	1

## Contact

Name: Gregorio Ujaque Perez

Email: gregori.ujaque@uab.cat

## Teachers

Gregorio Ujaque Perez

Arnau Carne Sanchez

## Teaching groups languages

You can view this information at the [end](#) of this document.

## Prerequisites

There are no official prerequisites. However, at the beginning of the course, students must know the fundamental concepts corresponding to the Chemistry courses (precipitation and redox). For those students who consider that their level of content is not adequate, a propaedeutic course is offered: <http://www.uab.cat/web/docencia-de-grau/propedeutics-1248648002523>. This intensive course of 15-20 hours is taught during the first weeks of September of the official course, and provides the student with a review of the most important concepts to be able to follow this course properly.

## Objectives and Contextualisation

The main objective of the subject is double. The first objective of this introductory course is to homogenize the level of knowledge of the student based on their previous pre-university studies. Based on this knowledge, the second objective is to provide the student with the necessary

In particular and among other knowledge, the course must provide security to the student in complex stoichiometric calculations and the formulation and nomenclature of the most important

chemical compounds; qualitative knowledge of the structure of the atom and the types of bonds present in molec

knowledge of the most important organic functional groups and the types of isomerism they show.

## Competences

- Adapt to new situations.
- Apply knowledge of chemistry to problem solving of a quantitative or qualitative nature in familiar and professional fields.
- Be ethically committed.
- Communicate orally and in writing in one's own language.
- Have numerical calculation skills.
- Learn autonomously.
- Manage the organisation and planning of tasks.
- Manage, analyse and synthesise information.
- Obtain information, including by digital means.
- Propose creative ideas and solutions.
- Reason in a critical manner
- Resolve problems and make decisions.
- Show an understanding of the basic concepts, principles, theories and facts of the different areas of chemistry.
- Show initiative and an enterprising spirit.
- Show motivation for quality.

## Learning Outcomes

1. Adapt to new situations.
2. Be ethically committed.
3. Communicate orally and in writing in one's own language.
4. Describe Valence bond and molecular orbital theories.
5. Describe the properties of the different aggregation states of matter, and relate these to chemical bonding and intermolecular forces.
6. Describe the structure of the atom.
7. Determine the electronic configurations of the elements and, from these, the properties of the elements.
8. Determine the hybridisation of atoms in molecules from Valence bond theory and apply molecular orbital theory to diatomic molecules.
9. Distinguish between the different types of chemical bonds and intermolecular interactions.
10. Draw Lewis structures of molecules and describe from these, their main properties.
11. Have numerical calculation skills.
12. Identify the processes of reduction and oxidation in a redox reaction and equalise the corresponding chemical equation.
13. Learn autonomously.
14. Manage the organisation and planning of tasks.
15. Manage, analyse and synthesise information.
16. Name and formulate the organic and inorganic chemical compounds.
17. Obtain information, including by digital means.

18. Propose creative ideas and solutions.
19. Reason in a critical manner
20. Resolve problems and make decisions.
21. Show initiative and an enterprising spirit.
22. Show motivation for quality.
23. Work properly with chemical equations and the main magnitudes of matter.

## Content

PART I. Matter, compounds and chemical reactions

Chapter 1. Matter and chemical compounds

Chapter 2. Introduction to chemical reactions

Chapter 3. Gases

PART II. Atomic structure and bonding

Chapter 4. Atomic structure

Chapter 5. The periodic table

Chapter 6. Chemical bonding

Chapter 7. Bonding in solids and liquids

Unless the requirements enforced by the health authorities demand a prioritization or reduction of these contents

## Activities and Methodology

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Exercise lessons	20	0.8	16, 3, 21, 22, 6, 5, 4, 8, 7, 10, 9, 14, 12, 2, 18, 19, 20, 11, 23
Study	106	4.24	1, 16, 13, 3, 21, 22, 6, 5, 4, 8, 7, 10, 9, 14, 15, 12, 2, 17, 18, 19, 20, 11, 23
Theoretical lessons	48	1.92	16, 6, 5, 4, 8, 7, 10, 9, 12, 23

The course Fonaments de Química I consists of two types of supervised activities, the theoretical sessions and the exercise sessions, which are distributed throughout the course in a 50/50 ratio. Theoretical sessions. Through the teacher's expositions the student must

of the subject and complement it with his/her personal study with the help of the materials that teachers have provided through the Campus

Virtual/Teams and the recommended bibliography. The theoretical sessions will be open to the participation of the students, who

the questions and clarifications that they deem necessary.

Exercise sessions. The objective of this supervised activity is to solve problems that have been previously raised to students through the Campus

Virtual and were asked to be resolved

previously, in group or individually. We aim to stimulate the participation in solving problems, taking advantage of it to consolidate the knowledge acquired during

and during their personal study.

The proposed teaching methodology may experience some modifications depending on the restrictions to face-to-face classes.

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

### Continuous Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Continuous work	20	20	0.8	1, 16, 13, 3, 21, 22, 6, 5, 4, 8, 7, 10, 9, 14, 15, 12, 2, 17, 18, 19, 20, 11, 23
Exams	80	6	0.24	1, 16, 13, 3, 21, 22, 6, 5, 4, 8, 7, 10, 9, 14, 15, 12, 2, 17, 18, 19, 20, 11, 23

Student evaluation will have two options: continuous evaluation and single evaluation.

#### OPTION A: Continuous Evaluation (this is the default option)

It will be done through several evaluation tests:

- Written exams:

There will be two partial exams throughout the course, one in the middle and the other at the end of the semester. Each of these exams will have a weight of 40% on the final mark (with a total of 80%). To be able to average the grade for each exam the mark must be  $\geq 4.0$ .

- Continued work:

Student evidences will be collected throughout the course (problems solved, individually or in groups, self-assessments on the Virtual Campus, short tests in class, etc.). These activities cannot be recovered unless the student provides a greater justification with the corresponding official documentation. This activity will have a weight of 20% of the grade.

Subject grade = Average grade of the partial tests (80%) + continuous work grade (20%)

#### Option B: Single Evaluation

Students who have accepted the single assessment modality will have to take a final test which will consist of an examination of the entire theoretical syllabus and problems of the subject. This test will be carried out on the day on which the students of the continuous assessment take the second part exam. The student's qualification will be:

Grade of the subject = Grade of the final test

Both for option A and B, the subject is passed with a 5. If the final grade does not reach 5, the student has another opportunity to pass the subject through the make-up exam that will be held on the date set by the degree coordination.

#### Not assessable:

The subject will be graded as "Not assessable" when: a) the student has not taken any of the partial and the final exams of the subject, or b) has delivered less than three activities of the Continued evaluation. If you have opted for the single assessment if you do not take the final test.

## **Bibliography**

Textbook

QUIMICA GENERAL: PRINCIPIOS Y APLICACIONES MODERNAS, R. H. Petrucci, F. G. Herring, J.D. Madura i C. Bissonnette , Pearson Educación SA, 10ª edición, Madrid 2011 (ISBN: 978-84-8322-680-3).

Other useful books:

CHEMISTRY: A MOLECULAR APPROACH, Nivaldo Tro, Pearson, 5th Ed. 2020

PRINCIPIOS DE QUÍMICA, P. Atkins i L. Jones, Médica Panamericana, 3ª edició, 2006.

QUÍMICA, R. Chang, McGraw-Hill, 9ª edició, 2010.

PRINCIPIOS DE FÍSICO-QUÍMICA, Ira N. Levine, McGraw-Hill 6ª edició, 2014

INTRODUCCIÓ A LA NOMECLATURA QUÍMICA INORGÀNICA I ORGÀNICA, J. Sales i J. Vilarrasa, Reverté, 5ª edició, 2003.

INTRODUCCIÓN A LA NOMENCLATURA DE LAS SUSTANCIAS QUÍMICAS, W. R. Peterson, Reverté, 2010.

Nomenclatura de Química:

Brief guides to Nomenclature IUPAC:

<https://iupac.org/what-we-do/nomenclature/brief-guides/>

## Software

The course does not imply the mandatory use of any specific software.

## Language list

Name	Group	Language	Semester	Turn
(PAUL) Classroom practices	1	Catalan	first semester	morning-mixed
(PAUL) Classroom practices	2	Catalan	first semester	morning-mixed
(PAUL) Classroom practices	3	Catalan	first semester	afternoon
(PAUL) Classroom practices	4	Catalan	first semester	morning-mixed
(TE) Theory	1	Catalan	first semester	morning-mixed
(TE) Theory	2	Catalan	first semester	afternoon