

**Chemistry**

Code: 100765  
ECTS Credits: 6

Degree	Type	Year	Semester
2500250 Biology	FB	1	1

**Contact**

Name: Xavier Solans Monfort  
Email: Xavier.Solans@uab.cat

**Use of languages**

Principal working language: catalan (cat)  
Some groups entirely in English: No  
Some groups entirely in Catalan: Yes  
Some groups entirely in Spanish: No

**Teachers**

Mireia García Viloca

**Prerequisites**

Although there is no special requirement for attending the course, it is advisable to have well acquired the contents of the subjects of chemistry, physics and mathematics of high school.

**Objectives and Contextualisation**

Many of the vital processes studied in different course of the Degree of Biology are explained using chemical formulations and molecular visions. Chemistry is, therefore, a basic tool for developing these other coursed within the biology degree.As a consequence, the objectives of the "Chemistry" course in the Biology degree are to list and explain the parameters necessary to understand the properties and behavior of biological processes presented in subsequent courses.

**Skills**

- Be able to analyse and synthesise
- Develop independent learning strategies.
- Understand and interpret the physicochemical bases of the basic processes of living beings

**Learning outcomes**

1. Be able to analyse and synthesise.
2. Correctly manipulate chemical equations, equalise them and make stochiometric calculations.
3. Describe conformational isomerism in alkanes and cycloalkanes and its application to biological systems.
4. Describe the fundamental principles underlying organic reactions and their application to biological systems.
5. Determine and represent the configuration of the chiral centres in chemical compounds and describe their properties and their importance in the field of biology.

6. Develop independent learning strategies.
7. Draw Lewis structures of chemical compounds and qualitatively predict the molecular properties based on these structures (molecular geometry and polarity).
8. Identify the functional organic groups present in biomolecules and name and formulate the corresponding organic compounds.
9. Identify the oxidation and reduction processes of a redox process and equalise the global reaction.
10. Solve basic problems in chemistry.

## Content

The course is divided in two main parts

Part 1: Atomic structure, bonding and structural organic chemistry

- 1.1. Atomic structure and atomic properties
- 1.2. Bonding: Basics concepts, Lewis structures, molecular geometries. Polarity.
- 1.3. Inter and intramolecular forces: hydrogen bonding and van der Waals
- 1.4. Functional groups in organic chemistry. Basic stereochemistry.

Part 2: Thermodynamics and aqueous equilibria

- 2.1. First law of thermodynamics
- 2.2. Second and third laws of thermodynamics
- 2.3. Chemical equilibrium
- 2.4. Acid base equilibria. Buffer solutions. Major species as function of pH.
- 2.5. Redox reactions. Oxidation and reduction processes. Nernst equation. Reaccions Red-ox. Oxidació i reducció. Mètodes d'igualació. Equació de Nernst

## Methodology

The Achievement of the knowledge of the course mandatory requires an important individual work from the student a part from the formal course. In this view, the use of general chemistry text books or other sources containing the basic concepts of general chemistry appears essential to pass the course.

The course includes the following activities.

### Master classes:

The professor presents the basic concepts related with the contents of the course and will assist the students in solving their doubts.

### Exercise classes:

Students will prepare the list of exercises proposed for each session previously and during the exercises courses, the professor will solve the key exercises as well as assist the students in those exercises that they have been unable to solve.

### Lab sessions:

The course includes two lab sessions in which some of the concepts of the course will be treated explicitly.

### Tutoring activities:

The professors of the course will be available for individual tutoring when required. In addition to this, a few collective tutoring classes will be performed along the course to discuss the how the course is evolving and solve collective doubts on the concepts of the course.

## Activities

Title	Hours	ECTS	Learning outcomes
<b>Type: Directed</b>			
Exercice classes	12	0.48	4, 6, 5, 7, 8, 9, 2, 10, 1
Lab session	8	0.32	4, 6, 5, 7, 8, 9, 2, 10, 1
Magistral courses	30	1.2	4, 5, 7, 8, 9, 2, 10, 1
<b>Type: Supervised</b>			
Tutoring	3	0.12	4, 6, 5, 7, 8, 9, 2, 10, 1
<b>Type: Autonomous</b>			
Resolution of exercices	20	0.8	4, 6, 5, 7, 8, 9, 2, 10, 1
Revision activities	12	0.48	4, 6, 5, 7, 8, 9, 2, 10, 1
Studing	50	2	4, 6, 5, 7, 8, 9, 2, 10, 1

## Evaluation

The knowledge acquired during the course will be evaluated through three different activities, each one with their own wieight at the final qualification.

1. Partial or final exams: During the course two partial exams will be done each one belonging to one of the parts of the course. Each partial exam will account for the 35% of the final mark. Students should obtain at lest 4.5 points of 10 in each exam to be allowed to pass the course. Alternatively, students with less than 4.5 at least on one of the exams will have to pass a final exams including all the contents of the course. In this final exams, students should also obtain a 4.5 up to 10 to be considered with the rest of other marks to get the final qualification. That, is the final exam substitutes the two partial exams and thus, it accounts for 70% of the final qualification.

2. Revision activities: At the end of each lesson one or two additional exercices will be proposed to the students. This additional exercices will be corrected and they will account for 15% of the final exam. These exercices could also be in the form of virtual test. There are no requirements of minimum mark to be accounted for the final qualification.

3. Lab sessions: At the end of each lab session each couple of students will have to fill a questionnaire and give it back to the professors before leaving. This questionnaire will be corrected and used to define 15% of the final mark, togheter with the lab skills showed during the lab sessions. No mimum mark requirements are fixed.

Overall, students obtaining more than 5 points up to 10 considering the three activities will pass the course. Absence in one of the lab session without any formal justification will cause the student to fail the course.

Students will be **No Available** when he or she has not attended more than 50% of the evaluation activities (in terms of qualification)

## Evaluation activities

Title	Weighting	Hours	ECTS	Learning outcomes
Final exam	70%	3	0.12	4, 3, 5, 7, 8, 9, 2, 10, 1
Lab session	15%	1	0.04	4, 6, 5, 7, 8, 9, 2, 10, 1
Partial exams	35% + 35%	5	0.2	4, 3, 5, 7, 8, 2, 10, 1
Revision activities	15%	6	0.24	4, 3, 6, 5, 7, 8, 9, 2, 10, 1

## Bibliography

1. R. H. Petrucci Química General Ed. Pearson Prentice Hall.
2. P. Atkins Principios de Química Ed. Paamericana
3. R. Chang, Química, Ed. Mc Graw Hill,