



Universitat de Lleida

DEGREE CURRICULUM  
**ESSENTIAL AND ORGANIC  
CHEMISTRY**

Coordination: GATIUS CORTIELLA, FERNANDO

Academic year 2023-24

## Subject's general information

|   |  |        |             |                  |
|---|--|--------|-------------|------------------|
| <b>Subject name</b>   | ESSENTIAL AND ORGANIC CHEMISTRY                                  |        |             |                  |
| <b>Code</b>   | 101534   |        |             |                  |
| <b>Semester</b>   | 1st Q(SEMESTER) CONTINUED EVALUATION                             |        |             |                  |
| <b>Typology</b>   | Degree   | Course | Character   | Modality         |
|   | Bachelor's Degree in Biomedical Sciences                         | 1      | COMMON/CORE | Attendance-based |
| <b>Course number of credits (ECTS)</b>  | 7.5  |        |             |                  |
| <b>Type of activity, credits, and groups</b>                                    | <b>Activity type</b>   | PRALAB | PRAULA      | TEORIA           |
|   | <b>Number of credits</b>   | 1      | 3           | 3.5              |
|   | <b>Number of groups</b>  | 3      | 2           | 1                |
| <b>Coordination</b>   | GATIUS CORTIELLA, FERNANDO                                       |        |             |                  |
| <b>Department</b>   | ENVIRONMENT AND SOIL SCIENCES AND CHEMISTRY                      |        |             |                  |
| <b>Teaching load distribution between lectures and independent student work</b> | Class hours: 75<br>Home hours: 112.5                             |        |             |                  |
| <b>Important information on data processing</b>                                 | Consult <a href="#">this link</a> for more information.          |        |             |                  |
| <b>Language</b>   | Catalan  |        |             |                  |
| <b>Distribution of credits</b>  | Activity PRALAB PRAULA THEORY<br>Credits 1 3 3.5<br>Groups 4 2 1 |        |             |                  |

| Teaching staff               | E-mail addresses         | Credits taught by teacher | Office and hour of attention |
|------------------------------|--------------------------|---------------------------|------------------------------|
| CANELA XANDRI, ANNA          | anna.canela@udl.cat      | 6                         |                              |
| GARCES GONZALEZ, JOSEP LLUIS | josepluis.garces@udl.cat | 1,2                       |                              |
| GATIUS CORTIELLA, FERNANDO   | fernando.gatius@udl.cat  | 3,8                       |                              |
| GUILLÉN MARTÍNEZ, PEDRO      | pere.guillen@udl.cat     | 1,5                       |                              |

## Subject's extra information

**VERY IMPORTANT:** if any activity cannot be carried out normally, it will be replaced by an alternative activity or followed virtually. Students must check Campus Virtual to find any changes that may occur, which will be communicated by means of a message in this platform.

The basic training of future graduates in Biomedicine includes understanding the concepts of General Chemistry and Organic Chemistry, in addition to the acquisition of skills related to these disciplines, for their later application in many practical cases, either in the study of other subjects of their curriculum, or in the events of their professional future. It is the basic training (which enables the construction of a solid conceptual framework) which defines a university graduate.

## Learning objectives

The student must be able to understand the different concepts of General Chemistry and Organic Chemistry included in the Program.

Regarding the General Chemistry a description of the matter, its properties and transformations.

Regarding Organic Chemistry, a set of essential basic knowledge is provided for understand the characteristics of molecules based on carbon. These molecules are essential for understanding the different biological processes that organisms can experience.

The student must know how to apply the acquired knowledge to specific situations and problems in the different fields of their specialty.

1. At a more concrete level of knowledge, the student who passes the subject must:

Know and know how to apply the concepts specified in the theoretical program.

Know how to use the concepts shown to interpret aspects of biochemistry and even morphology and physiology of living beings.

Know the terminology and the basic scientific language related to General Chemistry, Organic Chemistry and Biochemistry.

Achieve a full scientific education, with an important knowledge of the scientific method, of the character of the subject and the key role that theories and demonstrations play in the progress of the science.

2. The main teaching objectives that are to be achieved with the programmed activities are:

Know the structure of the atom, the basic constituent of matter.

Know the most basic principles of thermodynamics, as a basis for understanding the operation and laws that

regulate the different chemical processes.

Know how are the molecules that are part of living beings, their structure and their properties.

To know, at least partially, the reactivity and the behavior of these molecules both in natural conditions and in laboratory conditions.

3. In addition, the student who passes the subject has mastered:

The handling of the laboratory material and the knowledge of the minimum standards of safety and hygiene, without forgetting the need to recycle certain material.

The fundamentals of the conventional basic techniques used in research in the field of Organic Chemistry and other related disciplines.

The correct use of the basic technological environment (virtual campus, e-mail, electronic dossiers) and user-level general-purpose computer packages.

The acquisition of habits for self-training: knowing how to search, select and process information related to the subject using ICT.

The extraction of the most important aspects derived from the reading of a scientific text, the elaboration of a summary and the ability to expose it.

The ability to work individually or as a team (if applicable) in solving problems.

## Competences

Competences Collected in the BOE 15th February 2008, Ministerial Order ECI / 332/2008

### Basic

CB1 To possess and understand knowledge in an area of study that starts from the base of general secondary education, and is usually found at a level that, although supported by advanced textbooks, also includes some aspects that they involve knowledge from the forefront of your field of study.

CB2 To apply their knowledge to their work or vocation in a professional way and possess the competencies that are usually demonstrated through the elaboration and defense of arguments and the resolution of problems within their area of study.

### Specific

CE3. Define the basic principles of inorganic chemistry.

CE4 Apply solid knowledge of organic chemistry that is relevant to the biomedical sciences.

CE5. Apply the principles of inorganic chemistry, organic chemistry and physical chemistry in the study of biomolecules and fundamental biochemical processes.

## Subject contents

The program of the subject includes different types of activities.

THEORETICAL PROGRAM (35 h)

It is structured in two parts, corresponding to a set of 4 topics of General Chemistry and a second block of 4 topics based on knowledge, also very general, of Organic Chemistry:

BLOCK 1: GENERAL CHEMISTRY (15 h)

1. INTRODUCTION.

2. THERMODYNAMICS.

3. ACID-BASE EQUILIBRIUM.

4. PRECIPITATION AND COMPLEXATION.

BLOCK 2: ORGANIC CHEMISTRY (20 h)

1. INTRODUCTION. BASIC CONCEPTS OF ORGANIC CHEMISTRY.
2. FUNCTIONAL GROUPS.
3. ISOMERS .
4. REACTIVITY IN ORGANIC CHEMISTRY.

## CLASSES OF SEMINARS (30 h)

They are sessions in small groups of students where practical exercises are solved to reinforce the main concepts seen in the theory classes. Here the student has a more active role.

## PRACTICAL PROGRAM (10 h total, 2 h per practice)

Practical sessions are carried out in the laboratory and comprise 5 sessions of two hours each. The proposed program is the following:

No1: Safety and hygiene in a chemistry laboratory

No2: Redox evaluations

No3: Study of a chemical equilibrium. Principle of Le Châtelier.

No4: Separation processes: L-L extraction, chromatography and electrophoresis.

No 5: Structure models of organic molecules.

## HOME ACTIVITIES

Realization of Test type exercises, from a collection (database) corresponding to the subject and that students must solve individually via SAKAI.

Practical exercises of each topic.

## Evaluation

### EXAMINATIONS (70% of the final mark):

There will be a partial evaluation during the course and a final exam.

The partial evaluation represents 20% of the final mark.

The final exam in which the student will be examined from ALL the program represents 50% of the final mark.

### PRACTICES, SEMINARS AND NON-PRESENTIAL ACTIVITIES (30% of the final mark):

10% - Practical/Laboratory sessions (exam).

10% - Presentation of Organic Chemistry exercises via SAKAI.

10% - Individual delivery of exercises solved at the end of each topic.

Those students who can demonstrate the impossibility of attending classes due to work, may request at the beginning of the course (from the center's director of studies) an alternative evaluation that will take place on the same day as the second partial exam and will count 90% of the final qualification of the subject. These students must attend the practical sessions and evaluate themselves in a test-type exam that will count for the remaining 10% of the subject's qualification.

## Bibliography

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IEC, (1989); Nomenclatura de Química Orgánica. CSIC. Barcelona Mc MURRAY, J.; (2001). Química Orgánica. Thompson International.  
MORRISON R.T & BOYD R.K.(1998). Química Orgánica. Pearson Education  
PETRUCCI, I. R. & HARWOOD, W.S. (1999). Química general. Principios y aplicaciones modernas. Prentice Hall.  
PEIDRÓ, J. (1996). Problemas de química para el primer ciclo : un método didáctico, activo, para aprender a resolver problemas, 3 vol. EUB, Barcelona,  
RIBA, M.; CASERO, T.; VILARÓ F.; VILLORBINA, G. (2007). Química Orgánica: Problemes Resolts. Col·lecció EINES 55. Univ. de Lleida.  
SAÑA, J. (1993). Química per a les ciències de la naturalesa i l'alimentació. Vicens Vives.  
SOLOMONS, T.W. (1998). Fundamentos de Química Orgánica. Limusa VOLHARDT K.P. (2002). Química

