

Organic Chemistry and Laboratory

1. **Course number and name:** 020CORCI4 Organic Chemistry and Laboratory
2. **Credits and contact hours:** 2 ECTS credits, 1x1:15 contact hours
3. **Name(s) of instructor(s) or course coordinator(s):** Marie-Jose Zacca
4. **Instructional materials:** Course handouts; in-class problems

5. Specific course information

a. Catalog description:

This course begins with an introduction to organic chemistry, naming of organic molecules and their spatial representation. It enables students to master stereoisomerism and the reactivity of molecules: inductive and mesomeric effects, nucleophilic and electrophilic reagents. Then the reaction in organic chemistry is explained and the following organic compounds are studied: halogenated derivatives – alkenes and alkynes – benzene and aromatic compounds – Alcohols (substitution, elimination, oxidation) – carbonyl compounds (substitution on the acyl group) – reactions of aldehydes and ketones – Carboxylic acids, esters, amides and amines. After each part addressed, tutorials are treated in order to master the concept. Practical works are also conducted to let students master the methods of extraction filtration, purification and synthesis of organic products.

b. Prerequisites: None

c. Required/Selected Elective/Open Elective: Required

6. Educational objectives for the course

a. Specific outcomes of instruction:

- Master stereoisomerism (perspective representation, Cram convention, Newman projection, Fisher projection).
- Distinguish configuration stereoisomers from conformational stereoisomers, and within configuration stereoisomers, distinguish enantiomers from diastereoisomers while being able to give their absolute configuration.
- Know how to interpret and find inductive and mesomeric effects. Distinguish between homolytic and heterolytic reaction, nucleophiles and electrophiles, carbocations and carbanions.
- Write the products of pericyclic, substitution, addition, elimination, rearrangements and oxidation/reduction reactions.
- Write the mechanisms of SN1, SN2, E1 and E2.
- Name, give the properties and write the chemical reactions of alkanes, cycloalkanes, halogenoalkanes, alkenes, alkynes, alcohols, ethers, benzene and its derivatives, aldehydes and ketones (carbonyl compounds).
- Have a general idea about carboxylic acids, esters, amides and amines.
- Master organic synthesis methods (such as the extraction of caffeine from tea,

the synthesis of aspirin, the synthesis of dibenzalacetone, the chromic oxidation of menthol and the preparation of isoamyl ester).

- Understand purification, extraction and filtration in organic chemistry.
- Know the methods of drying and characterization of organic products.

b. PI addressed by the course:

PI	1.3	3.2	6.1	6.2
Covered	x	x	x	x
Assessed	x	x	x	x

7. Brief list of topics to be covered

- Chapter 1 : Stereoisomerism + exercises
- Chapter 2 : The reaction in organic chemistry + exercises
- Chapter 3 : Saturated hydrocarbons + exercises
- Chapter 4 : Unsaturated hydrocarbons + exercises
- Chapter 5 : Alcohols + exercises
- Chapter 6 : Benzene and its derivatives + exercises
- Chapter 7 : Carbonyl compounds (Aldehydes and Ketones) + exercises
- Chapter 8 : Carboxylic acids, esters, amides and amines + exercises
- Lab Sessions