

COURSE: Organic chemistry

ACADEMIC YEAR: 2017-2018

TYPE OF EDUCATIONAL ACTIVITY: base

TEACHER: Maurizio D'Auria

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web:

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mobile (optional):

Language: Italian

ECTS: 6 (lessons e
tutorials/practice)

n. of hours: 56 (40+16)
(lessons e
tutorials/practice)

Campus: Potenza
Dept./School: School of
Agriculture, Forest, Food and
Environmental Sciences
Program:

Semester: II

EDUCATIONAL GOALS AND EXPECTED LEARNING OUTCOMES

The course wants to give basic information on the principal properties of the organic compounds, allowing the student to understand the physical properties and the chemical behavior of every organic compounds.

- **knowledge and understanding:** the student has to know the structure of an organic compound and understand the chemical behavior in several experimental reaction conditions.
- **applying knowledge and understanding:** ability to have a critical approach to the design of a chemical compound, both for the preparation and for the possible degradation pattern.
- **making judgements:** Ability to be able to choose the best experimental conditions to achieve a certain result
- **communication skills:** Ability to properly define an organic compound and ability to draw it in the right way both in the plane and space
- **learning skill:** to know the main sources of update

PRE-REQUIREMENTS

- General and inorganic chemistry

SYLLABUS

The course is structured in three equivalent blocks each capable of defining 2 cfu.

1. *A. Electronic configuration. Bonds. Representing molecules.*
 - a. *Hydrocarbons: alkanes, alkenes, arenes, alkynes.*
 - b. *Compounds containing nitrogen: sp³ nitrogen, amines, sp² nitrogen, sp nitrogen.*
 - c. *Compounds containing oxygen: sp³ oxygen, alcohols, ethers, sp² oxygen, aldehydes and ketones, carboxylic acids and their derivatives.*
 - d. *Compounds containing sulfur.*
 - e. *Alkyl halides.*
 - f. *Heterocyclic compounds*
 - g. *Terpenes*
 - h. *Carbohydrates*
2. *Organic chemistry in the space.*
 - a. *Stereochemistry*
 - b. *conformations,*
 - c. *chirality.*
3. *The reactivity of an organic compound.*
 - a. *The organic reactions.*
 - b. *Reaction mechanisms: bimolecular nucleophilic substitution, electrophilic addition, monomolecular nucleophilic substitution, radicalic halogenation. Nucleophilic substitution at sp³ carbon.*
 - c. *Eliminations.*
 - d. *Oxidation of an alcohol.*
 - e. *Addition to carbon-carbon multiple bonds: electrophilic addition of HCl, HBr and H₂O, addition to conjugated dienes, electrophilic addition to alkynes, halogen addition, radical addition, hydroboration-oxidation, epoxidation, oxidation with osmium tetroxide, ozonization and ozonolysis, hydrogenation.*
 - f. *Aromatic electrophilic substitution.*
 - g. *Addition and nucleophilic substitution to the carbonyl group.*

h. Substitution alpha to carbonyl groups.

TEACHING METHODS

The course is organized as follows:

- classroom lessons on all subjects of the course;
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EVALUATION METHODS

Written examination. For the written tests there are six open tracks, covering both application aspects and theoretical themes.

TEXTBOOKS AND ON-LINE EDUCATIONAL MATERIAL

- o Maurizio D'Auria, *Chimica Organica Essenziale*, EditricErmes, Potenza, 2014
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INTERACTION WITH STUDENTS

Starting the course, after the description of the objectives, syllabus and evaluation methods, the teacher gives to the students the electronic available material. At the beginning of the course, after having described objectives, program and verification methods, the teacher makes available to the students the didactic material. It collects a list of students who intend to enroll in the course, together with name, serial number and email.

Office hours: Monday from 15 to 16 at the study and Tuesdays from 15 to 16 at the study

In addition to weekly reception, the instructor is available at all times for a contact with the students, through their e-mail

EXAMINATION SESSIONS (FORECAST)¹

13.2.2018; 13.3.2018; 15.5.2018; 12.6.2018; 10.7.2018; 9.10.2018; 11.12.2018.

SEMINARS BY EXTERNAL EXPERTS YES NO

FURTHER INFORMATION

Evaluation commission: Maurizio D'Auria, Rocco Racioppi, Paolo Lupattelli, Maria Funicello

¹ Subject to possible changes: check the web site of the Teacher or the Department/School for updates.