UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Organic Chemistry for Materials

2425-1-ESM01Q003

Aims

The teaching of Organic Chemistry is organized in the first two years of the degree course between this course, in the first year, and the course of the Laboratory of Organic Chemistry, in the second year. The overall objective of the two courses is to provide the student with the theoretical and practical bases of Organic Chemistry necessary to face the subsequent study of organic and hybrid materials.

Knowledge and understanding

At the end of the course the student knows:

- The main concepts related to the study of organic chemistry

- The main classes of organic substances (see list in the detailed content)

- The main properties and reactions of the organic substances listed in the detailed content

Applying knowledge and understanding

At the end of the course the student is able to:

- Have the basic knowledge on the organic substances listed in the detailed content

- Apply the main reactions of the organic substances listed in the detailed content

Making judgments

At the end of the course the student is able to:

- Recognize the main structural and chemical properties of the organic substances listed in the detailed content

- Apply the main reactions on the organic substances listed in the detailed content

Communication

Knowing how to describe in a clear and concise way in writing and orally with the language properties the main concepts of organic chemistry and the properties and reactivity of the main organic substances

Lifelong learning skills

Be able to deal with the study of other classes of organic substances and apply the study to the main classes of organic and hybrid materials, therefore also in different contexts from those presented during the course. Being able to extend knowledge independently through the study and analysis of advanced texts in Organic Chemistry and Organic Materials, in the scientific literature, patents and scientific-technical reports.

Contents

Basic concepts and description of main organic families.

Detailed program

1) References of general chemistry. The electronic structure and the covalent bond. 2) Acids and bases. 3) Introduction to organic compounds. 4) Isomers and arrangement of atoms in space. 5) Alkenes. 6) Reactions of alkenes and alkynes. 7) Delocalized electrons and their effects on stability, reactivity and pKa. Aromaticity - Reactions of benzene and substituted benzenes. 8) Reactions of substitution and elimination of alkyl halides.

Prerequisites

General and inorganic chemistry (1st year)

Teaching form

a) Lecture-Based Teaching: 34 hours
Interactive Teaching: 8 hours

b) Type: lectures and exercises

c) Number of hours delivered remotely (synchronous, without recording): 12 hours (goal: to reach a larger number of students in the presence of lectures with communications and content of particular interest to all students; can also be delivered in the afternoon-evening to better achieve the goal)

Textbook and teaching resource

P. Y. Bruice, Elements of Organic Chemistry, Edises

Semester

First year, second (spring) semester

Assessment method

The exam takes place with a **written test + oral test**.

To access the oral test it is mandatory to obtain a grade of at least 18/30.

Registration for the written and oral tests can be done via online secretariats. It is mandatory to register for the tests. Non-registered students will not be admitted to the tests.

The oral test may contain written parts (blackboard or on paper) in front of the examining commission to ascertain the ability and knowledge to present the topics covered in class in writing.

The written test and the oral test are aimed at verifying: the level of knowledge acquired; autonomy of analysis and judgement; the student's presentation skills; the correctness and clarity of exposition and description of concepts and knowledge both orally and in writing.

DATA

Data collected since academic year 2011-12

Average for the 1st written test: 21.5/30

Average for the 2nd written test: 21.4/30

Average for the written test (average of I and II test): 22.1/30

Average of the final exam (written + oral): 24.6/30

Office hours

All days from Monday to Friday upon e-mail request

Sustainable Development Goals

QUALITY EDUCATION