UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Organic Chemistry (blended)

2425-2-E3201Q074

Aims

Show the structure of organic compounds and the principles of their chemical reactivity. Show reactivity in the three dimensions.

Specifically, the teaching aims to provide:

- knowledge and understanding of the principles governing the chemical reactions of organic compounds, through lectures.

- ability to apply these principles to studies of interest to the sciences and technologies for the environment, through examples presented in class and in classroom exercises.

- autonomy of judgment and reasoning, through the analysis of real problems and the discussion and selection of solutions.

- communication skills and mastery of thermonology, through active participation in lectures and exercises.

- ability to learn, stimulated by the constant effort to resume and integrate previous knowledge, to analyze organic chemistry from an interdisciplinary point of view.

Contents

Organic natural and synthetic compounds. Electronic structure and chemical bond. Organic structures. Functional groups. Systematic nomenclature. Organic reactions. Reaction of alkanes and cycloalkanes. Chemical reactions and stereoisomery. Alogenoalkanes. Nucleophilic substitution and elimination. Oxygen and sulphur compounds. Alkenes, alkynes, carbonyl compounds. Aldehydes and ketones. Carboxylic acids and derivatives. Amines and other nitrogen compounds. Bifunctional compounds. Methods for the preparation of the carbon-carbon bond.

Benzene and other aromatic compounds.

Detailed program

Introduction

Bonding

Acidity/Basicity

Molecular Geometry

Molecular Orbitals

Functional Groups

Stereochemistry of Alkenes and Cycloalkanes Geometirc Isomers and Chirality

mechanisms of nucleophilic substitution

elimination reazioni radicaliche

Recognize and predict the chemical properties and reactivity of:

· Alkanes, Isomers and Nomenclature

· Alkenes and Alkynes

· Alkyl Halides, Substitution and Elimination Reaction Mechanisms

· Free Radical Reactions

· Alcohols and Organometallic Reagents in Syntheses

· Ethers and Epoxides

· Aldehydes and ketones

· Carboxylic acid, carboxylic esters, acylic chlorides

· Ammines

· Aromatic compounds: benzene, phenols

Classroom exercises (10 h) will be carried out, consisting of practical and real applications of the theoretical notions learned.

Prerequisites

General and inorganic chemistry

Teaching form

20 lessons (2 h), 40 h Delivered Didactics in presence
3 exercises (2 h) 6 h total Interactive Teaching in presence
2 exercises (2 h) 4 h total Interactive Teaching on line

Textbook and teaching resource

Bruno Botta. CHIMICA ORGANICA. edi-ermes

Brown e Foote. Chimica Organica. Ed EdiSES

Cacchi, Nicotra. Esercizi di Chimica Organica. Casa Editrice Ambrosiana

Molecular Framework Models, Ed. Prentice Hall.

More References:

Bruice. Chimica Organica. Ed. EdiSES.

Semester

First semester

Assessment method

Oral examination on the topics covered in class

Mark range 18-30/30

The questions during oral examination verify the knowledge of organica chemistry, by studing the reactivity of functional groups. The knowledge about nomenclature and stereochemical principles will be also evaluated

Office hours

Every day. It is necessary to fix the meeting by E-mail

Sustainable Development Goals

QUALITY EDUCATION | RESPONSIBLE CONSUMPTION AND PRODUCTION | CLIMATE ACTION