Organic Chemistry II is a continuation of Organic Chemistry I. Topics such as electrophilic addition reactions, nucleophilic addition reactions, $S_{N}1$ and $S_{N}2$, and elimination reactions $E1$ and $E2$ are retaken in a much deeper detail than in Organic Chemistry I. Also, the stability of organic compounds, intermolecular reactions and interactions are addressed.

The central part of the course comprises the study of different mechanisms of chemical reactions, which are linked to functional groups. A good knowledge of chemical reactivity is essential in the course. This knowledge is then applied to a number of classes of compounds, natural products and industrial materials. Attention is paid to the relevant link between organic chemistry and everyday's life and agrochemical and pharmaceutical sciences.

Additionally, attention is paid to the industrial preparation of the most important industrial (intermediate) compounds (e.g., benzene, acetaldehyde...) and the principles of oil refinery. Natural products, an introduction on the use of dyes and synthesis and applications of the most common polymers are included.

Laboratory experiments help the student to acquire the needed insights in Organic Chemistry. Priority is given to the understanding of the chemical reactivity of the compounds that are used and their properties. The different mechanisms of chemical reactions are illustrated by means of selected practical exercises. These experiments are accompanied by an introduction concerning safety and toxicology and a theoretical explanation of the different exercises.
- Substitution and elimination reactions ($S_{N}1$ and $S_{N}2$; E1 and E2)
- Stability of organic compounds
- Intermolecular reactions
- Retrosynthesis
- Reactions mechanisms, applied to the synthesis/retrosynthesis of halogen compounds, alcohols, phenols, ethers, amines, carbonyl compounds, carbon-nitrogen double and triple bonds, heterocyclic aromatic compounds, sulphur and phosphorous compounds...
- Natural products
- Industrial preparation of the most important industrial (intermediate) compounds (e.g., benzene, acetaldehyde...)

2. Practical sessions:
- 1,3-diphenyl-2-propenone (aldol condensation)
- Isoamyl acetate (esterification, cfr. aroma products)
- Diphenylmethanol (reduction)
- Aspirine (analgetic)
- Biodiesel (re-esterification)
- Phenoxyacetic acid (cfr. Herbicides)
- Methyl orange

Initial competences
Competences acquired in Organic Chemistry 1.

Final competences

Knowledge
Concepts: nomenclature, molecular structure of C bonds, electrophilic addition reactions, electrophilic aromatic substitution reactions, nucleophilic substitution reactions, elimination reactions, stability of organic compounds, acid and bases.
Insights: relevant link between organic chemistry and everyday's life and agrochemical life, detailed notion in organic molecules, with their elements, bonds, steric structure, stability, mutual interaction; elaboration of reaction mechanisms; interpretation of physical and chemical properties of functional groups; good knowledge of chemical reactivity.

Skills
Methods: experience in organic chemistry laboratory, handling of organic compounds (safety), knowledge of safety principles, performing simple experiments and purification methods.

Conditions for credit contract
Access to this course unit via a credit contract is determined after successful competences assessment

Conditions for exam contract
This course unit cannot be taken via an exam contract

Teaching methods
Guided self-study, lecture, practicum

Learning materials and price
Syllabus ‘Organic Chemistry I and II’ by Prof. Heynderickx

References

References within the syllabus

Course content-related study coaching

Evaluation methods
end-of-term evaluation and continuous assessment

Examination methods in case of periodic evaluation during the first examination period
Written examination with open questions, written examination with multiple choice questions, oral examination

Examination methods in case of periodic evaluation during the second examination period

(Approved)
Examination methods in case of permanent evaluation
   Participation, job performance assessment, report

Possibilities of retake in case of permanent evaluation
   Examination during the second examination period is possible in modified form

Calculation of the examination mark
   Written examination with open questions and multiple choice questions (60 + 10%)
   Performance assessment (practical + attitude) (10%)
   Lab reports (20%)