Organic Chemistry (J000007)

Valid as from the academic year 2016-2017

Course Specifications

Course offerings and teaching methods in academic year 2017-2018

A (year)    Dutch    seminar: coached  30.0 h
             practicum  20.0 h
             lecture    60.0 h

Lecturers in academic year 2017-2018

Madder, Annemieke    WE07    lecturer-in-charge

Offered in the following programmes in 2017-2018

Bachelor of Science in Pharmaceutical Sciences

11    A

Teaching languages

Dutch

Keywords

Structure, reactivity

Position of the course

The course in Organic Chemistry introduces the basic knowledge concerning the characteristics of organic structures and the most important types of organic reactions. Emphasis is on insight in the mechanisms. This course constitutes the direct basis for the later courses in Biochemistry, Medicinal Chemistry and Pharmaceutical Chemistry.

Contents

Theory Part I:

- Elektron configuration with focus on carbon and the correct construction of Kekulé-Lewis structures.
- Orbital overlap: the covalent bond, hybridisation and the carbon skeleton in alkanes and cycloalkanes.
- Polar covalent bonds and the functional groups based on C, H, N and O.
- Elektron delokalisation (resonance): pi-systems and aromaticity.
- Dynamical geometry and conformational analysis with focus cyclohexane.
- Elektrophilic addition to the non-polarised pi-bond
- Stereoisomery.

Theory Part II:

- Reversal of polarity (halogenated alkanes en organometallic compounds)
- Nucleophilic substitution reactions
- Elimination reactions
- Elektrophilic substitution on aromatic molecules
- Acyl substitution reactions
- Addition reactions to carbonyl compounds
- Carbonyl-alpha substitution
- Radical reactions
- Introduction to pericyclic reactions
- Redox reactions in organic chemistry

Contact hrs 105.0 h

Study time 330 h

Credits 11.0

Course size 1

(Approved)
Part practical exercises:
Basic experimental skills (filtration, drying, recrystallisation, distillation, extraction) concerning a few relevant themes: chemistry of milk (caseïne, lactose), ethanol and fermentation, chromatography, preparation of aspirine.

Initial competences
Final competences of secondary school or competences corresponding herewith.

Final competences
1 Theory part:
   • To recognize the diverse characteristics of an organic structure, more specifically the carbon skeleton and the functional groups

2 • To analyse the symmetry of an organic molecule

3 • To determine the absolute configuration of stereocentra in organic molecules

4 • To master mechanistic insight in the most important types of organic reactions

5 • To discuss the course related relevant theories and models

6 Practical Part:
   • To be aware of the importance of prevention and the related rules when working in an organic chemistry lab

7 • To show awareness of environmental aspects (waste treatment, consumption of water and electricity) and safety issues (handling of products with dangerous properties, wearing safety glasses, knowledge of emergency procedures)

8 • To conduct specific experimental procedures in a thoughtful way

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
Lecture, practicum, seminar: coached exercises

Learning materials and price
Dutch syllabus (approximate price 14 €).


References
Molecular models (~30 €)

Course content-related study coaching
Students have various options for asking questions, both individually and in group, to the lecturer or assistants: before or after classes, during theoretical and practical exercise sessions or upon appointment with the lecturer. On regular moments problem sessions will be organized where the students can ask questions to the student councillor of the Monitoring Service: Karen.Saerens@UGent.be.

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

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

Written examination with open questions

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

Extra information on the examination methods

Permanent evaluation of the practical exercises: preparation (curios), presence, attitude, written evaluation (evaluation of the reports concerning the practical exercises) + oral interrogation by the assistants. The second examination opportunity for the permanent evaluation (practicum) implies a written examination concerning the practical classes.

Calculation of the examination mark

Periodic evaluation for theory (40%) and exercises (55%).
Permanent evaluation for practical classes (1 introductory course + 5 halve days, 5%): Practical exercises + 1 interrogation.
Students who are unduly absent from the practical courses and thus do not participate to the permanent evaluation, cannot pass.