



Faculty of Health, Science and Technology
Chemistry

Syllabus

Organic Chemistry B

Course Code:	KEGB01
Course Title:	Organic Chemistry B <i>Organisk kemi B</i>
Credits:	7.5
Degree Level:	Undergraduate level
Progressive Specialisation:	First cycle, has less than 60 credits in first-cycle course/s as entry requirements (G1F)

Major Field of Study:
KEA (Chemistry)

Course Approval

The syllabus was approved by the Faculty of Health, Science and Technology 2019-08-27, and is valid from the Spring semester 2020 at Karlstad University.

Prerequisites

Registered for 30 ECTS credits of Chemistry, including at least 7.5 ECTS credits in Organic Chemistry, or equivalent

Learning Outcomes

The aim of the course is for students to acquire basic knowledge and skills for a career in the chemistry field and for further studies in chemistry.

Upon completion of the course, students should be able to:

- give an account of the properties and reactions of radicals,
- describe the most important reaction pathways for polymer production,
- give an account of the properties and reactions of carbonyl compounds,
- give an account of the production and use of some compounds containing nitrogen,
- give examples of and explain strategies for simple multi-step synthesis,

- describe some important reactions and reagents in synthesis processing,
- plan and conduct simple multi-step syntheses,
- perform simple chemical structural analyses using molecular spectroscopy and mass spectroscopy,
- perform simple risk assessment, and
- present an experiment in the field, orally and in writing, within given time limits.

Content

The course is based on foundational organic chemistry but uses theories and concepts from other courses in basic chemistry to describe, explain, and predict the properties and reactions of organic molecules. The course comprises two modules which are examined separately:

Theory module

- The structure of carbon compounds and their reactions, grouped according to functional group with associated reaction mechanisms. The classes of compounds treated are different types of carbonyl compounds and amines but also some reactions with alkenes, alkynes, aromatics, alcohols, and esters.
- Structure-related factors affecting molecular stability and reactivity
- Introduction to retrosynthesis as the basis for planning multi-step syntheses
- Basic principles for structural analysis using IR and NMR spectroscopy and mass spectrometry
- Equipment and tools for chemical laboratory work

Laboratory module

- Simple one- and multi-step syntheses in milligram and gram scale, including the most important unit operations
- Application of gas chromatography and IR and NMR spectroscopy for analysing reaction processes and reaction products linked to separation processes and spectroscopy in related chemistry areas
- Flow charts, report writing, routines for journal laboratory notes, and performing risk analysis.

Reading List

See separate document.

Examination

Assessment is based on active participation in laboratory sessions and seminars, and on individual written reports. Attendance is mandatory for scheduled seminars and laboratory sessions. Passing a laboratory safety test is required before a student may participate in laboratory sessions.

If students have a decision from Karlstad University entitling them to Targeted Study Support due to a documented disability, the examiner has the right to give such students an adapted examination or to examine them in a different manner.

Grades

One of the grades Distinction (VG), Pass (G), or Fail (U) is awarded in the examination of the course. Engineering students are awarded a grade on the scale 5 (Pass with Distinction), 4 (Pass with Some Distinction), 3 (Pass) or U (Fail).

Quality Assurance

Follow-up relating to learning conditions and goal-fulfilment takes place both during and upon completion of the course in order to ensure continuous improvement. Course

evaluation is partly based on student views and experiences obtained in accordance with current regulations and partly on other data and documentation. Students will be informed of the result of the evaluation and of any measures to be taken.

Course Certificate

A course certificate will be provided upon request.

Additional information

The local regulations for studies at the Bachelor and Master levels at Karlstad University stipulate the obligations and rights of students and staff.

The course KEGB01 cannot be included in the same degree programme as the courses KEGBOO and KOK230.