Course syllabus for

General and Organic Chemistry, 20 credits

Allmän och organisk kemi, 20 hp
This course syllabus is valid from autumn 2013.
Please note that the course syllabus is available in the following versions:
Autumn2007 , Autumn2008 , Autumn2010 , Autumn2011 , Autumn2012 , Autumn2013

Course code	1BI000
Course name	General and Organic Chemistry
Credits	20 credits
Form of Education	Higher Education, study regulation 2007
Main field of study	Biomedicine
Level	G2 - First cycle 2
Grading scale	Excellent, Very good, Good, Satisfactory, Sufficient, Fail, Fail
Department	Department of Medical Biochemistry and Biophysics
Participating institutions	• Department of Physiology and Pharmacology • Institute of Environmental Medicine
Decided by	Programnämnden för biomedicinprogrammet
Decision date	2007-06-11
Revised by	Programme committee for study programmes in biomedicine
Last revision	2020-01-27
Course syllabus valid from	Autumn 2013

Specific entry requirements

Biology 2, Physics 2, Chemistry 2, Mathematics 4 (field specific entry requirements A13). Or: Biology B, Physics B, Chemistry B, Mathematics D (field specific entry requirements 13).

Objectives

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

- describe, classify and systematically name (organic) molecules based on chemical and physical characteristics,
- explain and predict mechanisms of basic organic-chemical reactions,
- describe and classify chemicals according to their risks in the laboratory and for the environment,
- describe the relationships between molecular structure and pharmacological effect of drugs and between their physico-chemical properties and bioavailability,

- perform basic organic-chemical laboratory work independently and safely, have knowledge of and be able to describe the risks associated with the procedures and chemicals used,
- describe and analyse own organic-chemical laboratory work by, for example, writing a well-structured, understandable and complete report following scientific ethics for publishing results,
- choose separation and analytical methods for basic chemical problems and interpret simple chromatograms and analysis spectra,
- search and find relevant original and overview literature concerning organic-chemical questions to retrieve information for problem-solving and communication to others,
- describe procedures and suggest applications of modern drug design, and reflect on it in the context of drug development by the pharmaceutical industry.

Content

The course content is oriented towards substances and methods of special biomedical interest and provides a basis for later courses in the programme.

The course is divided into the following parts:

Basic chemistry, 2.0 hp

Grading scale: GU

Carbonyl and unsaturated compounds, 3.0 hp

Grading scale: GU

Organic and bioorganic chemistry, 2.0 hp

Grading scale: GU

Environmeental and medicinal chemistry, 1.0 hp

Grading scale: GU

Organic-chemical laboratory work, 6.0 hp

Grading scale: GU

Laboratory techniques with laboratory safety. Common methods in organic-chemical and bioorganic synthesis work. Classification and labeling of chemicals, standard values and limits. Lab reports.

Integration of theory and practice, 6.0 hp

Grading scale: AF

Teaching methods

The teaching includes lectures, laboratory sessions, group tuition (seminars), study visits and project works. It is, to a large extent, directed towards problem-solving. The project works are advanced studies in groups, with an emphasis on own work and literature studies.

Examination

Basic chemistry (2 credits). The examination consists of a written test. Graded Fail/Pass.

Carbonyl and unsaturated compounds (3 credits). The examination consists of a written test. Graded Fail/Pass.

Organic and bioorganic chemistry, incl. project work (2 credits). The examination consists of an oral presentation of project work. Graded Fail/Pass. A written test with voluntary participation will be offered. The results of this test may be beneficial for grading of the course (bonus points).

Environmental and medicinal chemistry (1 credit). The examination consists of a poster presentation about the study visits. Graded Fail/Pass.

Organic-chemical laboratory work (6 credits). The examination consists of a written test in laboratory safety and techniques, observations of the student's laboratory skills, and labreports. Graded Fail/Pass. The results of two individually written lab reports may be beneficial for the grading of the course (bonus points).

Integration of theory and practice (6 credits). The examination consists of a written examination. Graded A-F. For participation in the written examination it is required that the parts Basic chemistry and Carbonyl and unsaturated compounds are approved. For the mandatory tests connected to the parts Basic chemistry and Carbonyl and unsaturated compounds, a session providing a second chance for passing is organised before the written final examination.

The final grade for the whole course is based on the grade for the part Integration of theory and practice and the collected bonus points from the parts Organic and bioorganic chemistry, incl. project work and Organic-chemical laboratory work. To pass the whole course (grade E or above), the grade E must have been obtained for the part Integration of theory and practice and the grade pass must have been obtained for the other parts on the course.

Compulsory participation
Laboratory sessions, project work, study visits and group tuition including practical parts or demonstrations, are compulsory, as well as presentations and lectures linked to these parts. Part of the course is an examination in laboratory safety and technology that must be passed before start of the subsequent laboratory sessions. At the beginning of each laboratory session, an oral examination is performed that must be approved before the student starts experimenting. The course director assesses if and, in that case, how absence can be compensated. Before the student has participated in all compulsory parts or compensated absence in accordance with the course director's instructions, the student's results for respective part will not be registered in LADOK.

Limited number of examinations or practical training sessions
Students who have not passed the regular examination are entitled to participate in five more examinations. If the student is not approved after four examinations, he/she is recommended to retake the course at the next regular course date, and may, after that, participate in two more examinations. If the student has failed six examinations/tests, no additional examination or new admission is provided.

The number of times that the student has participated in one and the same examination is regarded as an examination session. Submission of a blank examination is regarded as an examination. An examination, for which the student registered but not participated in, will not be counted as an examination.

Transitional provisions

The course has been cancelled and was offered for the last time in the fall semester of 2013.

Other directives

The course languages are Swedish and English.

Course evaluation will be carried out in accordance with the guidelines established by the Board of Higher Education.

Oral evaluation in the form of course council meetings will be carried out during the course.

Literature and other teaching aids

Mandatory literature

Byström, Styrbjörn; Cronholm, Tomas; Rothstein, Susanne

Laborationshandledning i organisk kemi för biomedicinprogrammet (kandidat) vid Karolinska Institutet.

Stockholm : 2008

Fessenden, Ralph J.; Fessenden, Joan S.; Logue, Marshall W.

Organic chemistry

Pienta, Norbert J.; Kessler, Robert J.; Young, Paul R.

6. ed. : Pacific Grove, Calif. ;a London : Brooks/Cole, Grove, Calif. ;a London :b Brooks/Cole,c 1998 - 1170 s.

ISBN:0-534-35199-9 LIBRIS-ID:5037202

Library search

Recommended literature

Berg, Jeremy M.; Tymoczko, John L.; Stryer, Lubert

Biochemistry

7. ed., International ed. : Basingstoke : Palgrave Macmillan, cop. 2012 - xxxii, 1098, [78] s.

ISBN:978-1-4292-7635-1 LIBRIS-ID:12135215

Library search

Only two chapters (8 and 9) of the textbook "Biochemistry" (Berg et al.) are relevant to the course, so it is sufficient to borrow the book from the library for your studies instead of buying it.