



LUND
UNIVERSITY

Faculty of Science

KEMA03, Chemistry: Biochemistry - Basic Course, 7.5 credits

Kemi: Biokemi - grundkurs, 7,5 högskolepoäng

First Cycle / Grundnivå

Details of approval

The syllabus was approved by Study programmes board, Faculty of Science on 2009-11-26 and was last revised on 2009-11-26. The revised syllabus applies from 2010-07-01, autumn semester 2010.

General Information

The course is a compulsory first-cycle course for a degree of Bachelor of Science, main field of study Chemistry, and an elective course for a degree of Bachelor of Science, main field of study Molecular Biology.

Language of instruction: Swedish

Main field of studies

Molecular Biology

Chemistry

Depth of study relative to the degree requirements

G1N, First cycle, has only upper-secondary level entry requirements

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Learning outcomes

The aim of the course is to provide students with basic knowledge and understanding of the structure, chemical properties and function of key biomolecules, and general knowledge and understanding of energy metabolism in living cells.

The objective is that the students, on completion of the course, shall have acquired the following knowledge and skills.

Knowledge and understanding

On completion of the course, the students shall be able to

- demonstrate good understanding of the general structure of cells

- master the basic principles of biochemical evolution
- account for the general structure and chemical properties of proteins and the forces that underlie different structural levels, as well as some common co-factors
- demonstrate understanding of the principal working methods of enzymes, and account for some concrete examples from the glycolysis and citric acid cycle
- account for the most common structures and functions of nucleic acids, and know how basic genetic engineering tools work
- describe the central catabolism (glycolysis and citric acid cycle) with regard to localisation, participating components, reactions and enzyme names
- in the same way, account for mitochondrial electron transport and oxidative phosphorylation as well as photosynthetic electron transport and photophosphorylation
- manage and understand the acid-base properties in common biomolecules

Competence and skills

On completion of the course, the students shall be able to

- apply names and structures to common biomolecules
- demonstrate skills in basic laboratory biochemistry and be able to evaluate such laboratory results
- search for biochemical information and report biochemical information in speech and writing

Course content

Lectures:

- cell structure with organelles, nucleic acids, protein membranes, and basic principles for biochemical evolution
- protein structure and the acid-base properties of functional groups
- the structure and function of nucleic acids
- the flow of genetic information
- basic tools for studies and modification of nucleic acids
- general principles for the working methods and regulation of enzymes
- central catabolic energy metabolism in cells: glycolysis, citric acid cycle and oxidative phosphorylation
- photophosphorylation and NADPH production.

Laboratory exercises: The purpose of the laboratory exercises is to provide training in basic laboratory biochemistry, while integrating the theoretical content of the course. A minor theoretical project enables students to practise biochemical information retrieval, and communication of biochemical information.

Course design

The teaching consists of lectures, group work and laboratory exercises. The laboratory exercises and projects are compulsory.

Assessment

The assessment is based on a written exam at the end of the course. A re-sit examination is offered soon after the examination to students who do not pass.

Subcourses that are part of this course can be found in an appendix at the end of this document.

Grades

Marking scale: Fail, Pass, Pass with distinction.

For a grade of Pass on the whole course, the student must have passed the exam, the laboratory exercises and the project, and have participated in all compulsory components.

The grades awarded for the exam are Fail, Pass, and Pass with Distinction.

The grades awarded for the laboratory exercises and the project are Fail and Pass.

The final grade is determined by the grade of the exam.

Entry requirements

General and courses corresponding to the following Swedish Upper Secondary School Programs: Chemistry 2, Mathematics 4, Physics 1a/1b1+1b2.

Further information

The course may not be included in a degree together with KEM101 General Chemistry 1, 15 credits, or KEMA72 Chemistry for Environmental and Biological Sciences – General Course 2, 15 credits.

Subcourses in KEMA03, Chemistry: Biochemistry - Basic Course

Applies from H13

- 0711 Biochemistry - Basic Course, 5,5 hp
Grading scale: Fail, Pass, Pass with distinction
- 0712 Biochemistry - Basic Course, Laboratory Work, 2,0 hp
Grading scale: Fail, Pass

Applies from H07

- 0701 Biochemistry - Basic Course, 7,5 hp
Grading scale: Fail, Pass, Pass with distinction
- 0702 Biochemistry - Basic Course, Laboratory Work, 0,0 hp
Grading scale: Fail, Pass