



Faculty of Science

KEMM32, Chemistry: Bioinorganic Chemistry, 7.5 credits

Kemi: Bio-oorganisk kemi, 7,5 högskolepoäng

Second Cycle / Avancerad nivå

Details of approval

The syllabus was approved by Study programmes board, Faculty of Science on 2008-03-12 and was last revised on 2008-03-12. The revised syllabus applies from 2008-07-01, autumn semester 2008.

General Information

The course is an optional second-cycle course for a degree of Master of Science in Chemistry.

Language of instruction: Swedish and English
When necessary, the course in full is given in English.

Main field of studies

Chemistry

Depth of study relative to the degree requirements

A1N, Second cycle, has only first-cycle course/s as entry requirements

Learning outcomes

The aim of the course is to illustrate the function of transition metals in biological systems and to provide in-depth understanding of the basic chemical mechanisms that affect their reactivity.

The aim of the course is that on its completion students will have acquired the following skills and knowledge:

- the ability to describe, in overview, chemical bonds in, and the spectroscopic properties of, transition metal complexes and their relevance to biological metal centres
- the ability to describe and explain, in overview, reaction mechanisms and structures and the spectroscopic properties of known intermediates for metalloenzymes
- general knowledge of medical applications of metal complexes
- familiarity with the literature of modern bioinorganic chemistry and databases for searching for sources in chemical literature; the ability to read and understand

primary research reports within bioinorganic and, to some extent, biophysical chemistry

Course content

Lectures: treat the role of metals in biological systems and cover basic coordination chemistry. The structure and reactivity of metalloenzymes, common reaction mechanisms for monooxygenases, dioxygenases, oxotransferases, peroxidases, oxidases, nitrogenases, hydrolases and hydrogenases, among others. The use of medical preparations containing metal and their interaction with biologically relevant target molecules, e.g. nuclein acids and proteins.

Laboratory work: selected to illustrate the theory and to provide training in experimental work.

Course design

Teaching takes the form of lectures, seminars and laboratory work. Participation in seminars and laboratory work is compulsory.

Assessment

Assessment comprises a written or oral examination and oral and written presentations during 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.

To be awarded Pass students must pass the examination, pass the laboratory work and participate in all compulsory components.

The examination grades are: Pass with Distinction, Pass or Fail. Grades for the compulsory components are: Pass or Fail.

The final grade for the course is determined by weighting the results of the examination and the oral and written presentations.

Entry requirements

To be eligible for this course students must have basic eligibility and 90 higher education credits in completed Science courses, including passes in courses equivalent to:

- KEMA00 General and Analytical Chemistry 7.5 credits, KEMA01 Organic Chemistry – Basic Course 7.5 credits, KEMA02 Inorganic Chemistry – Basic Course 7.5 credits and KEMA03 Biochemistry – Basic Course 7.5 credits, or

KEM101 General Chemistry 1 15 credits and KEM102 General Chemistry 2 15

credits, or

KEM111 Chemistry for Environmental and Biological Sciences – General Course 1
15 credits and KEM122 Chemistry for Environmental and Biological Sciences –
General Course 2 15 credits

and

- KEMB09 Physical Chemistry – Basic Course 15 credits or KEM103 General Chemistry 3 15 credits,
- KEMB29 Spectroscopy and Dynamics 7.5 credits and KEMB12 Inorganic chemistry 7.5 credits, or
KEMB02 Inorganic Chemistry, 15 credits or KEM113 Inorganic Chemistry 15 credits

Equivalent knowledge that has been gained in another way also provides eligibility for the course.

Further information

The course cannot be credited as part of a degree programme that also includes KEMM02 Inorganic Chemistry – Advanced course, 15 credits, or KEM033 Inorganic Chemistry – Advanced course 15 credits.

Subcourses in KEMM32, Chemistry: Bioinorganic Chemistry

Applies from H13

- 0811 Bioinorganic Chemistry, 5,0 hp
Grading scale: Fail, Pass, Pass with distinction
- 0812 Bioinorganic Chemistry, Compulsory Elements, 2,5 hp
Grading scale: Fail, Pass

Applies from H08

- 0801 Bioinorganic Chemistry, 7,5 hp
Grading scale: Fail, Pass, Pass with distinction
- 0802 Bioinorganic Chemistry, Compulsory Elements, 0,0 hp
Grading scale: Fail, Pass