



KD2155 Solid State Chemistry: Structures and Methods 7.5 credits

Fasta tillståndets kemi: struktur och metoder

This is a translation of the Swedish, legally binding, course syllabus.

If the course is discontinued, students may request to be examined during the following two academic years

Establishment

Course syllabus for KD2155 valid from Spring 2020

Grading scale

A, B, C, D, E, FX, F

Education cycle

Second cycle

Main field of study

Chemical Science and Engineering

Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

Intended learning outcomes

After completion of the course the student will be able to:

- Describe the relationship between structure and chemical bonding and draw conclusions about the physical properties of materials such as macroscopic magnetic, electrical and optical behaviour, describe structure, physical properties of semiconductors and operation principles of semiconductor devices.
- Describe the basic principles of solid-state NMR, X-rays diffraction and electron microscopy, describe and exercise selected methods of solid state synthesis.

Course contents

- The crystalline state and description of crystal structures
- Determination of solid structures, practical use of databases
- Bands and bonding structure of solids
- Physical properties of various solids
- Production and characterization of some nanomaterials
- Basic principles of X-ray diffraction
- Basic principles of electron microscopy
- Basic principles of solid state NMR spectroscopy

Specific prerequisites

At least 150 credits from grades 1, 2 and 3 of which at least 110 credits from years 1 and 2, and bachelor's work must be completed, within a programme that includes: 75 university credits (hp) in chemistry or chemical engineering, 20 university credits (hp) in mathematics and 6 university credits (hp) in computer science or corresponding

Course literature

R. Tilley, Understanding Solids: The Science of Materials, 2e, Wiley 2013

Distributed course material

Examination

- LAB1 - Laboratory Work, 2.5 credits, grading scale: P, F
- TEN1 - Written Exam, 5.0 credits, grading scale: A, B, C, D, E, FX, F

Based on recommendation from KTH's coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

Other requirements for final grade

Completed and passed all course components

Ethical approach

- All members of a group are responsible for the group's work.
- In any assessment, every student shall honestly disclose any help received and sources used.
- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.