FCK3314 Solid State Chemistry: Structures and Methods 7.5 credits

Fasta tillståndets kemi: strukturer 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 FCK3314 valid from Spring 2020

Grading scale

P, F

Education cycle

Third cycle

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 should have the knowledge and ability 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 behavior, describe structure, physical properties of semiconductors and operation principles of semiconductor devices.(TEN1)
- Describe the basic principles of solid-state NMR, X-rays diffraction and electron microscopy, describe and exercise selected methods of solid state synthesis. (LAB1, TEN1)
- Describe how spectroscopic, diffraction, or microscopy methods are used or propose how they can be used in the PhD student's own research project (PRO1)

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

Eligible for studies at the third-cycle level.

Examination

- LAB1 - Laboratory work, 2.5 credits, grading scale: P, F
- PRO1 - Project report, 1.0 credits, grading scale: P, F
- TEN1 - Written exam, 4.0 credits, grading scale: P, 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.

Approved exam (TEN1 4.0 ECTS)

Approved lab reports (LAB1: 2.5 ECTS)

Approved project report (PRO1: 1.0 ECTS)

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.