HL2022 Quantum Mechanics of Electron Microscopy 7.5 credits

Kvantmekanik inom elektronmikroskopi

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 HL2022 valid from Spring 2010

Grading scale

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

Education cycle

Second cycle

Main field of study

Medical Engineering

Specific prerequisites

Bachelor's degree in Engineering physics, Electrical Engineering, Computer Science or equivalent. Basic knowledge of anatomy.

Language of instruction

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

Intended learning outcomes

In order to understand the interaction of electrons with matter and how an image is formed in the electron microscope it is necessary to have a solid foundation in quantum mechanics. After this course you should be able to account for the contributions of elastic and inelastic scattering to electron microscopic images of biological and non-biological specimens.

Course contents

Basic quantum mechanics, quantum mechanical scattering theory for elastic and inelastic scattering of charged particles, image formation in the electron microscope

Course literature

Introduction to Quantum Mechanics in Chemistry, Material Sciences and Biology, S.M. Blinder, Elsevier, ISBN 0-12-106051-9;
Molecular Quantum Mechanics, 3rd edition, P.W. Atkins and R.S. Friedman, Oxford University Press, ISBN 0-19-855947-X;
copied handouts

Examination

- TEN1 - Examination, 7.5 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.

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.