SH2502 Synchrotron Radiation Based Atomic and Molecular Physics 6.0 credits

Synkrotronljusbaserad atom- och molekylfysik

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

Establishment

Course syllabus for SH2502 valid from Autumn 2007

Grading scale

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

Education cycle

Second cycle

Main field of study

Physics

Specific prerequisites

Recommended prerequisites: 5A1247/SH1009 Modern Physics. SH2500 Atomic-and Molecular Physics.

Language of instruction

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

Intended learning outcomes

The course is a continuation of 5A1246 and SH2500. Introductory molecular physics will be treated in more detail, while the main part of the course will give an insight into the modern experimental tools used in atomic- and molecular physics, with special emphasis laid on synchrotron based methods.

Course contents

The structure of molecules. Rotational-, vibrational- and electronic spectra. Franck-Condons principle, scattering processes.
Light sources, spectrometers and detectors. Synchrotron light, production and characteristics. The use of synchrotron light in basic research, photo- absorption,-emission, -ionization and -dissociation. Technical applications of synchrotron light, X-ray lithography and X-ray microscopy, holography.

Course literature

Haken-Wolf: " Molecular physics and elements of quantum chemistry", Springer Verlag.

P. Erman and E. Rachlew-Källne: ”The use of Synchrotron Radiation in Atomic and Molecular Physics” (Compendium).

Examination

- ÖVN1 - Project, 1.5 credits, grading scale: P, F
- TEN1 - Examination, 4.5 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.

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

Other requirements for final grade

Active participation in the lectures including an oral presentation of some part of the subject (ÖVN1; 1,5 university credits). One written exam (TENA; 4,5 university credits).

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.