



SH2302 Nuclear Physics 8.0 credits

Kärnfysik

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

The course syllabus is valid from Spring 2022 according to the school principal's decision:
S-2022-0529 Decision date: 2022-02-24

Grading scale

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

Education cycle

Second cycle

Main field of study

Physics

Specific prerequisites

English B / English 6

Language of instruction

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

Intended learning outcomes

The course aims to give the students a broad knowledge of nuclear physics, to increase their understanding of phenomena in the microcosmos and of fundamental physical principles, and also to demonstrate how society can benefit from our knowledge in this field. The course also has an emphasis on laboratory work using advanced nuclear instrumentation.

Course contents

Nuclear forces and the structure of the nucleon. Nucleon-nucleon interactions. The deuteron. Nuclear stability. Overview of nuclear models. Nuclear decay (radioactivity). Nuclear reactions. Nuclear astrophysics (nucleosynthesis, stellar processes) Interactions of ionizing radiation in matter. Principles for detection of ionizing radiation. Particle accelerators and their applications. Nuclear energy production (fission, fusion). Nuclear medicine. Material analysis and other applications of nuclear physics.

Examination

- LAB1 - Laboratory Work, 4.0 credits, grading scale: P, F
- TEN1 - Examination, 4.0 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

One written examination (TEN1; 4 university credits).
Laboratory work (LAB1; 4 university credits) with written reports.

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.