FSK3404 Laser Physics 7.5 credits

Laserfysik

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

Establishment

The head of school at the SCI school has 2020-05-18 decided to establish this syllabus to apply from Spring 2021, registration number: S-2020-0731.

Grading scale

P, F

Education cycle

Third cycle

Specific prerequisites

Language of instruction

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

Intended learning outcomes

After the course the student should be able to:

- Apply physical principles for explaining how light amplification and laser action is obtained in different material systems.

- Apply laser engineering principles to design and analyze laser parameters in the context of a particular application.
- Obtain, analyze and present experimental data, within the scope of the goals of lab practice, and complying with the lab safety requirements and rules of conduct in a given lab environment.

Course contents

- Essentials of quantum-mechanical description of optical gain media, including atoms, molecules, and solid state materials.
- Basic properties of lasers and photon amplifiers.
- Physical principles of laser action.
- Essentials of laser building blocks.
- Overview of the most important laser types and applications.

Examination

- TEN1 - Written exam, 5.5 credits, grading scale: P, F
- LAB1 - Laboratory work, 2.0 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.

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

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.