



SK2404 Optical Measurement Technology 7.5 credits

Optisk mätteknik

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

Establishment

The course plan applies from and including VT 2024 according to school head decision: X-2023-0147. Decision date: 2023-03-24

Grading scale

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

Education cycle

Second cycle

Main field of study

Engineering Physics

Specific prerequisites

SK2303 (Optical Physics, 7.5 credits) or equivalent.

Language of instruction

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

Intended learning outcomes

After passing the course, students must be able to:

- design basic optical components
- identify physical measurement problems where (fiber) optics can be used
- design and perform basic measurements using optical fiber sensors
- analyze experimental results from optical experiments

Course contents

The course covers a range of optical measurement techniques, with an emphasis on optical sensors. The structure of the course is based on a general overview with the aim of providing an understanding of basic sensor concepts covering measurement parameters, materials, light sources and detectors. Lectures cover examples and theory with different solutions for specific applications. Laboratory exercises will provide hands-on experience of related topics, with guest speakers from industry presenting the use of optical measurement technology in industrial applications. If possible, on-site company visits will be arranged.

Specifically, the course covers the following topics:

Basic knowledge of light sources, detectors and detection techniques. Optical measurements with non-classical light sources. Knowledge of basic principles of optical fiber sensors, as well as manufacturing and handling. Analysis of optical fiber sensors the transfer matrix method. Interferometric sensors for temperature and strain detection, distance and rotation measurements. Absorption, Raman and fluorescence spectroscopy.

Examination

- LAB1 - Laboratory work, 2.0 credits, grading scale: P, F
- SEM1 - Seminars, 2.0 credits, grading scale: P, F
- INL1 - Home assignments, 1.5 credits, grading scale: A, B, C, D, E, FX, F
- TEN1 - Oral examination, 2.0 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.

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.