



# SK2403 Applied Photonics 6.0 credits

Tillämpad fotonik

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

## Establishment

The course plan is valid from and including VT 2023 according to the headmaster's decision: S-2022-1334. Decision date: 2022-10-10

## Grading scale

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

## Education cycle

Second cycle

## Main field of study

Engineering Physics

## Specific prerequisites

At least 120 credits in engineering and natural sciences and knowledge of English B or equivalent.

## Language of instruction

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

# Intended learning outcomes

After completing the course, the student should be able to

- explain the structure and working principles of basic photonic devices.
- make calculations and measurements to quantify performances of various photonic devices.
- design appropriate photonic devices for achieving certain system requirements, including the aspects of energy consumption and sustainable development.
- analyze the technological limits of various photonic devices and describe potential solutions to those problems.

# Course contents

The course covers both physical and engineering principles of different photonic components in visible, near-infrared, and mid-infrared wavelength ranges, which enable our modern information society.

Specifically, the course covers the following topics:

- Light-emitting diodes
- Semiconductor lasers
- Optical amplifiers
- Optical detectors
- Solar cells
- Optical Modulators
- Optoelectronic integration
- Display technologies
- Photonics in lighting
- Infrared sources
- Visible and infrared imaging

# Examination

- LAB1 - Laboratory work, 1.0 credits, grading scale: P, F
- INL2 - Assignments, 5.0 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.

The examiner, in consultation with the KTH Disability Coordinator (Funka), decides on any adapted examination for students with documented permanent impairment. The examiner may grant another examination form for reexamination of single students.

## Other requirements for final grade

The course is examined by written exam (TEN1; 4 credits, grade scale A / B / C / D / E / Fx / F), as well as approved assignments (INL1; 1 credits, grade scale P / F) and laboratory work (LAB1; 1 credits, grade scale P / F). The rating on TEN1 determines the grade on the course.

## 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.