SK2400 Quantum Electronics with Electro Optics 12.0 credits

Kvantelektronik inkl elektrooptik

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

Course syllabus for SK2400 valid from Autumn 2013

Grading scale

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

Education cycle

Second cycle

Main field of study

Engineering Physics,Physics

Specific prerequisites

For external students the following are required: 120 credits within natural sciences and engineering or corresponding knowledge and documented proficiency in English B or corresponding knowledge.

Recommended previous knowledge:
SK2300 (Optical physics, 6 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 the course, the student should understand and have knowledge in quantum optics, lasers, electro-optics and nonlinear optics so to be able to solve, with the necessary literature, practical or theoretical problems within the given fields.

Course contents

Quantum mechanics directed towards quantization of the electromagnetic field. Electromagnetic field, coherent states. Gaussian beams, optical resonators and rate equations. Types of lasers. Electro-optic and acousto-optic modulation of light. Nonlinear optical formalism and parametric processes. Optical waveguides. Coupled Mode Theory.

Disposition

Lectures, accompanied by quizzes in Scalable Learning. Home Assignments distributed during the course. Final written Exam

Course literature

Yariv, “Photonics: Optical Electronics in Modern Communications”, Oxford University Press

Examination

- INL2 - Hand- in- Tasks, 8.0 credits, grading scale: P, F
- TEN2 - Final 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

Examination through hand-in assignments (INL1, 8 hp, P/F) and final examination (TEN1, 4 hp, A-F) - 12 credits, grading scale A/B/C/D/E/Fx/F.

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.