FSK3600 Quantum Electronics 8.0 credits

Kvantelektronik

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 FSK3600 valid from Autumn 2012

Grading scale

Education cycle

Third cycle

Specific prerequisites

Optical Physics

Enrolled as PhD student

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, optical modulators, detectors and waveguides, nonlinear and ultrafast optics so to be able to solve, with the necessary literature, practical and 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. Q-switching and mode-locking. Optical waveguides and detectors.

Course literature

Yariv, "Optical Electronics in Modern Communications", Oxford University Press (1997) . Additional material will be made available during the course.

Examination

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) (P/F) and final examination (TEN1) (P/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.