Faculty of Science

FYST43, Physics: Optics and Optical Design, 7.5 credits

Fysik: Optik och optisk design, 7,5 högskolepoäng

Second Cycle / Avancerad nivå

Details of approval

The syllabus was approved by Study programmes board, Faculty of Science on 2009-10-07 to be valid from 2009-10-07, spring semester 2010.

General Information

The course is an elective course for first-cycle studies for a scientific candidate - or Master's degree (120 credits) in physics.

Language of instruction: English

Main field of studies	*Depth of study relative to the degree requirements*
Physics	A1N, Second cycle, has only first-cycle course/s as entry requirements

Learning outcomes

The aim of the course is that students should have acquired the following knowledge and skills on completion of the course:

Knowledge and understanding

On completion of the course, the student should:

- have knowledge of optics that allows the student to design and build industrial optical applications
- understand why and when an optical problem can be solved by means of beam optics instead of wave optics and
- understand important concepts such as polarisation, diffraction, interferometry and holography.

Skills and abilities

On completion of the course, the student should be able to:

- independent make adjustments and measurements within optics
- calculate the propagation of light through different optical components
- calculate and build optical systems.
- have increased ability to orally and in writing present projects that have been carried out.

Judgement and approach

On completion of the course, the student should be able to:

- search and integrate knowledge from extensive English reading lists
- have increased experience to work in groups towards a common goal

Course content

- Beam optics, matrix formulation
- Wave optics
- Fourier optics
- Electromagnetic optics
- Polarisation

Three laboratory sessions: Interferometry, Fourier optics and Polarisation. A project in optical design by means of a modern ray tracing program.

Course design

The teaching consists of lectures, 3 laboratory sessions, group work and projects. Participation in laboratory sessions, projects and thereby related teaching is compulsory.

Assessment

Examination takes place in writing at the end of the course, together with a graded longer project that is carried out independently or in groups. Students who do not pass the regular exam are offered a new possibility shortly after the regular exam.

Subcourses that are part of this course can be found in an appendix at the end of this document.

Grades

Marking scale: Fail, Pass, Pass with distinction.
To pass the entire course, approved examination, approved laboratory reports and ray tracing project report and participation in all compulsory parts are required.

The grade is obtained by weighting the results on the examination and on the larger project.

Entry requirements

For admission to the course, knowledge is required equivalent 90 credits in natural sciences and knowledge equivalent to FYSA31 Physics 3, Modern physics, 30 credits, and English B.

Further information

The course is the first of a series of four courses within photonics that uses the same book.

Subcourses in FYST43, Physics: Optics and Optical Design

Applies from H09

0901 Optics and Optical Design, 7,5 hp
Grading scale: Fail, Pass, Pass with distinction