Optics - Theory and Application

Programme course

4 credits

Optik - teori och tillämpning

TFYA84

Valid from: 2017 Spring semester

Determined by
Board of Studies for Electrical Engineering, Physics and Mathematics

Date determined
2017-01-25

Offered for the last time
Spring semester 2022

Main field of study
Applied Physics, Physics

Course level
First cycle

Advancement level
G1X

Course offered for
- Biomedical Engineering, M Sc in Engineering
- Applied Physics and Electrical Engineering, M Sc in Engineering
- Physics, Bachelor´s Programme
- Applied Physics and Electrical Engineering - International, M Sc in Engineering

Entry requirements
Note: Admission requirements for non-programme students usually also include admission requirements for the programme and threshold requirements for progression within the programme, or corresponding.

Prerequisites
Calculus in one and many variables. Oscillations and waves. Linear algebra.

Intended learning outcomes
The aim of the course is to give basic knowledge elektromagnetic waves with a focus on optics.
After successful examination the student should;

- be able to solve problems related to geometrical optics
- be able to solve problems related to wave optics
- be able to solve problems related to photon optics

Furthermore, the student should be able to;

- perform optical measurements
- present measurements, results and conclusions

Course content
Ray optics, wave optics, photon optics.

Teaching and working methods
The lectures are meant to give a basic understanding of the subject. During lectures the most important theory sections are presented together with some applied exercises. The knowledge is deepened and applied through special problem solving sessions. The course also contains laboratory work related to optics.

Examination

KTR1	Optional Assignment	0 credits	U, G
TEN1	Written examination	3 credits	U, 3, 4, 5
UPG2	Laboratory work and group assignments	1 credits	U, G

The optional assignments may give bonus points on the written exam.

Grades
Four-grade scale, LiU, U, 3, 4, 5

Other information
Supplementary courses: The course content is relvant for several upcoming courses on the programme (Electronics, Measurement technology, Electromagnetism, Fourier analysis, Modern Physics, Signals and systems etc.). Materials optics, Optoelectronics.

Department
Institutionen för fysik, kemi och biologi

Director of Studies or equivalent
Magnus Johansson

Examiner
Kenneth Järrendahl

Course website and other links
https://www.ifm.liu.se/edu/coursescms/optik/

Education components

Preliminary scheduled hours: 48 h
Recommended self-study hours: 59 h

Course literature

Göran Jönsson, "Våglära och optik" (kapitel 11-20), 5:e upplagan (ISBN: 9789163389573). Övrigt material via kursens Lisamrum.

Common rules

Regulations (apply to LiU in its entirety)

The university is a government agency whose operations are regulated by legislation and ordinances, which include the Higher Education Act and the Higher Education Ordinance. In addition to legislation and ordinances, operations are subject to several policy documents. The Linköping University rule book collects currently valid decisions of a regulatory nature taken by the university board, the vice-chancellor and faculty/department boards.

LiU's rule book for education at first-cycle and second-cycle levels is available at http://styrdokument.liu.se/Regelsamling/Innehall/Utbildning_pa_grund-_och_avancerad_niva.