



Course syllabus for

Geometrical Optics, 7.5 credits

Geometrisk optik, 7.5 hp

This course has been cancelled, for further information see Transitional provisions in the last version of the syllabus.

Course code	1OP053
Course name	Geometrical Optics
Credits	7.5 credits
Form of Education	Higher Education, study regulation 2007
Main field of study	Optometry
Level	G1 - First cycle 1
Grading scale	Pass with distinction, Pass, Fail
Department	Department of Clinical Neuroscience
Decided by	Programnämnd 8
Decision date	2012-05-08
Revised by	Education committee CNS
Last revision	2020-04-01
Course syllabus valid from	Autumn 2012

Objectives

The course aims to give basic knowledge of geometric refraction and paraxial reproduction in optical systems needed in further optician education and professional work. On completion of the course, the student should independently be able to:

- account for and use the concept of image in an optical system
- solve optical problems related to paraxial reproduction, lateral enlargement and visual fields in systems of spherical lenses and surfaces.
- describe and analyse imaging properties of a compound optical system by means of a major plane
- account for function and calculate optical characteristics of various basic optical instruments
- evaluate visual instruments and visual aid based on the concept of angular magnification
- use simple eye models
- account for spherical refractive errors of the eye and the concept of far point and make simple calculations of optical correction based on the correction principle.

Content

The course is divided in two (2) part:

Geometrical optics, 6.5 hp

Grading scale: VU

Radiation concepts, real and virtual images. Speculative and diffuse reflection, reflection law, total reflection. Absorption, and transmission, refractive law. Paraxial approximation, flat surface imaging and thin prisms. Reproduction in spherical interfaces, thin lenses, thick lenses, general lens systems. Graphical beam construction. The major plane concept. Apertures, field stops, vignetting, F-numbers and numerical aperture. Camera, eye, magnifier, microscopy, telescopes, ocular and projectors.

Lab experiments, 1.0 hp

Grading scale: GU

Practical laboratory assignments in geometrical optics.

Teaching methods

The teaching is given in the form of lectures interleaved with calculation exercises and assisted problem solving where the theoretical knowledge is illustrated and practiced individually through calculation examples. The course also comprises laboratory sessions that aim at an increased understanding of the optics through practical assignments.

Examination

The course part Geometrical optics is examined through written examination. The grading scale Fail/Pass/Pass with distinction. The part Lab experiments is examined based on submitted laboratory assignments. Grading system Fail/Pass.

In case of a Pass grade in the part Geometrical Optics, and in the part Lab experiments, the whole course is graded with a Pass. A Pass with distinction in the part Geometrical optics, and a Pass in the part Lab experiments, result in a Pass with distinction in the entire course

Compulsory attendance at laboratory sessions. In case of absence, measures are discussed with the course director.

Criteria for the evaluation of the parts of the course are stated in a separate document.

Limited number of examinations or practical training sessions

Students who have not passed the regular examination are entitled to participate in five more examinations. If the student has failed six examinations/tests, no additional examination or new admission is provided. The number of times that the student has participated in one and the same examination is regarded as an examination session. Submission of a blank examination is regarded as an examination. An examination for which the student registered but not participated in, will not be counted as an examination..

Transitional provisions

The course has been cancelled and was offered for the last time in the fall semester of 2018. Last examination according to this syllabus will be provided the fall semester of 2021 for students who have not completed the course.

Other directives

Course evaluation will be carried out in accordance with the guidelines established by the Board of Education.

The course is given in cooperation with the department of Applied physics, section of Biomedical physics and X-ray physics at the Royal Institute of Technology (KTH).

The teaching language is Swedish but parts of the course may be given in English.

Literature and other teaching aids

Freeman, Michael Harold

Optics

Hull, C. C.; Charman, W. N.

11. ed. : Oxford : Butterworth-Heinemann, 2003 - 563 s.

ISBN:0-7506-4248-3 LIBRIS-ID:8917891

[Library search](#)