Technology
Arts Sciences
TH Köln

Course
PHO1 - Photo Technology 1

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General information

Long name	Photo Technology 1
Approving CModule	PHO1_BaMT
Responsible	Prof. Dr. Gregor Fischer Professor Fakultät IME
Level	Bachelor
Semester in the year	winter semester
Duration	Semester
Hours in self-study	78
ECTS	5
Professors	Prof. Dr. Gregor Fischer Professor Fakultät IME
Requirements	none
Language	German, English if necessary
Separate final exam	Yes

Final exam

Details

Written exam with arithmetic and comprehension excercises, can also be held as multiple choice test

Minimum standard

50% of maximum points

Exam Type

Written exam with arithmetic and comprehension excercises, can also be held as multiple choice test

Lecture / Exercises

Learning goals

Knowledge

Physical basics of light
wave-particle-dualism
Harmonic oscillation
Polarization
Interference
Phenomenons of light propagarion
reflection law
Dispersion
Absorption
Scattering

Geometrical optics
Imaging equations, graphical ray tracing
Concept of the principal planes
Imaging by spheric surface
Ray computation
Stops, pupils and ports
optical aberrations, critical aperture
Unsharpness by diffraction, optical resolution
Photographic lenses

Optical image design
Perspective
Depth of Field
Scheimpflug
In-motion Unsharpness

Skills

understand the nature of light and the phenomenons of light propagation

ray tracing graphically or by calculation

analyse and model the function of optical systems by equivalent optical variables

classify and distinguish optical abberations

understand the limitation of the optical resolution due to different causes and define the requirements by the human eye

model and calculate the 3D effects for the optical image design

Expenditure classroom teaching

Type	Attendance (h/Wk.)
Lecture	2
Exercises (whole course)	1
Exercises (shared course)	0
Tutorial (voluntary)	2

Separate exam

none

Practical training

Learning goals

Skills

use and control polarization effects at dielectric surfaces

measure and assess the optical parameters of photographic lenses

apply means for the optical image design (perspective, depth of field, in-motion unsharpness)

apply optical settings effectively

realize optical measurements by means of a digital camera

document the results

Expenditure classroom teaching

Type	Attendance (h/Wk.)
Practical training	1

Tutorial (voluntary)	0

Separate exam

Exam Type

working on practical scenarion (e.g. in a lab)

Details

Technical discussion / colloquium before lab excercise

Protocol reports about lab excercises

Minimum standard

Reports for all lab excercises must be delivered in correct form with correct results