Technology
Arts Sciences
TH Köln

Course Manual PHO1

Photo Technology 1

Version: 3 | Last Change: 08.10.2019 22:19 | Draft: 0 | Status: vom verantwortlichen Dozent freigegeben

General information

Long name	Photo Technology 1
Approving CModule	PHO1_BaMT
Responsible	Prof. Dr. Gregor Fischer Professor Fakultät IME
Valid from	winter semester 2020/21
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

Literature

- E. Hecht, Optik, Oldenbourg
- Pedrotti/Bausch/Schmitt, Optik für Ingenieure, Springer
- Naumann/Schröder, Bauelemente der Optik, Hanser
- G. Schröder, Technische Optik, Vogel
- G. Schröder, Technische Fotografie, Vogel
- W. Baier, Optik,Perspektive und Rechnungen in der Fotografie, FBV Leipzig
- J. Flügge, Studienbuch zur technischen Optik, UTB Vandenhoeck
- J. Flügge, Leitfaden der geometrischen Optik und des Optikrechnens, UTB Vandenhoeck

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	EN Klausur

− Lecture / Exercises

Learning goals

Goal type	Description
Knowledge	Physical basics of light wave-particle-dualism Harmonic oscillation Polarization Interference Phenomenons of light propagarion reflection law Dispersion Absorption Scattering
Knowledge	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
Knowledge	Optical image design Perspective Depth of Field Scheimpflug In-motion Unsharpness
Skills	understand the nature of light and the phenomenons of light propagation
Skills	ray tracing graphically or by calculation
Skills	analyse and model the function of optical systems by equivalent optical variables
Skills	classify and distinguish optical abberations
Skills	understand the limitation of the optical resolution due to different causes and define the requirements by the human eye
Skills	model and calculate the 3D effects for the optical image design

Special requirements

none

Accompanying material	electronic slides as presented during lectures, electronic collection of excercises
Separate exam	No

Expenditure classroom teaching

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

− Practical training

Learning goals

Goal type	Description
Skills	use and control polarization effects at dielectric surfaces
Skills	measure and assess the optical parameters of photographic lenses
Skills	apply means for the optical image design (perspective, depth of field, in-motion unsharpness)
Skills	apply optical settings effectively
Skills	realize optical measurements by means of a digital camera
Skills	document the results

Expenditure classroom teaching

Type	Attendance (h/Wk.)
Practical training	1
Tutorial (voluntary)	0

Special requirements

none

Accompanying material	electronic instructions for the lab-exercises, electronic tools: access to raw image data MTF analysis software
Separate exam	Yes

Separate exam

Exam Type	EN praxisnahes Szenario bearbeiten (z.B. im Praktikum)
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