Technology Arts Sciences
TH Köln

Course Manual BVM

Medical Imaging

Version: 1 | Last Change: 29.09.2019 18:36 | Draft: 0 | Status: vom verantwortlichen Dozent freigegeben

− General information

Long name	Medical Imaging
Approving CModule	BMO_BaET, BMO_BaOPT
Responsible	Prof. Dr. Uwe Oberheide Professor Fakultät IME
Valid from	summer semester 2023
Level	Bachelor
Semester in the year	summer semester
Duration	Semester
Hours in self-study	78
ECTS	5
Professors	Prof. Dr. Uwe Oberheide Professor Fakultät IME

Literature

Dössel - Bildgebende Verfahren in der Medizin, Springer

Kaschke, Donnerhacke, Rill – Optical Devices in Ophthalmology and Optometrie

Final exam

Details	Testing the taxonomy levels of understanding and applying by describing interaction processes in an idealized application environment. Testing the taxonomy level of analyzing by means of real use cases to select diagnostic or therapeutic procedures.
Minimum standard	50 % of the questions and tasks correctly solved
Exam Type	EN mündliche Prüfung, strukturierte Befragung

Requirements	Physics: wave propagation, acoustics, thermodynamics
	Laser technology: laser types, coherence length, beam shaping
	light-matter interaction: absorption, scattering, refractive index
	Detection methods of electromagnetic radiation, simulation options for light propagation
	Mathematics: integral calculus, Fourier transformation
Language	German
Separate final exam	Yes

— Lecture / Exercises

Learning goals

Goal type	Description
Knowledge	Overview of imaging techniques (Ultrasound imaging, X-ray projection method / computer tomography, Magnetic resonance imaging, Posittron emission tomography, Optical (coherence) tomography, Hybrid process of optical and acoustic methods, Scheimpflug imaging) Interaction between radiation and matter (absorption, emission, dispersion, reflection, refractive index, ionization) Areas of application and limitations of individual methods (resolution, imaging vs. penetration depth, image reconstruction algorithms)
Skills	Selection of the appropriate procedure by analysis of the advantages and disadvantages Transfer of processes to industrial areas (quality assurance, material testing) apply basic social and ethical values Finding meaningful system boundaries by abstracting the essential aspects of a technical problem

Expenditure classroom teaching

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

Special requirements

Accompanying material	Presentation slides for the lecture Links to Internet resources with basic information
Separate exam	No

− Lecture / Exercises

Learning goals

Goal type	Description
Knowledge	Presentation of a current publication of an english-language professional journal
Skills	Procurement of suitable literature/information Familiarisation with new technical field of expertise Use of english technical literature Evaluation of available literature Checking the relevance of information Filtering out essential information and preparing it for the appropriate target group

Expenditure classroom teaching

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

Special requirements

Accompanying material	Links to specialist journals and university library interlibrary loans Current publications from specialist journals
Separate exam	Yes

Separate exam

Exam Type	EN Fachgespräch (Interview) zu besonderen Fragestellungen (Szenario, Projektaufgabe, Lieraturrecherche)
Details	Presentation on a given topic with literature research The presentation should be adapted to the previous knowledge of the students of the course and enable a discussion of the content.
Minimum standard	structured presentation of the most important points with a list of related sources