Technology
Arts Sciences
TH Köln

Course
BVM - Medical Imaging

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General information

Long name	Medical Imaging
Approving CModule	BMO_BaET, BMO_BaOPT
Responsible	Prof. Dr. Uwe Oberheide Professor Fakultät IME
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
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

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

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.

Lecture / Exercises

Learning goals

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

Separate exam

none

Seminar

Learning goals

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

Separate exam

Exam Type

discussion (interview) about special issues (szenario, project assignment, literature research)

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