Biomedical Optics

Programme course

6 credits
Biomedicinsk optik
TBMT36
Valid from: 2019 Spring semester

Determined by
Board of Studies for Electrical Engineering,
Physics and Mathematics

Date determined
2018-08-31
Main field of study
Biomedical Engineering

Course level
Second cycle

Advancement level
A1X

Course offered for
- Master's Programme in Biomedical Engineering
- Engineering Biology, M Sc in Engineering
- Biomedical Engineering, M Sc in Engineering
- Applied Physics and Electrical Engineering - International, M Sc in Engineering
- Applied Physics and Electrical Engineering, M Sc in Engineering

Entry requirements
Note: Admission requirements for non-programme students usually also include admission requirements for the programme and threshold requirements for progression within the programme, or corresponding.

Prerequisites
Anatomy and Physiology, Biomedical Engineering, Biomedical Signal Processing, Medical Images and basic knowledge in electromagnetic radiation and optics.

Intended learning outcomes
The course should provide a possibility for the student to acquire knowledge about the physical properties of light and its impact and interaction with biological tissue. After passing the course the student should be able to
- describe and choose suitable light sources, detectors and wavelengths applicable to specific medical applications and demands.
Course content

Optical properties of biological tissue.
Measurement of tissue optical properties.
Light transport in tissue.
The therapeutic window.
Light transport modeling and simulation.
Applications with: diffuse reflectance spectroscopy, hyperspectral imaging, fluorescence spectroscopy, molecular imaging, multiphoton excitation, optical coherence tomography, photoacoustic imaging, laser Doppler imaging, etc.

Teaching and working methods

The course has a strong student-centered focus. This includes tutorial sessions, seminars, lectures, workshops and laboratory work.

Examination

TEN1  Written examination  U,3,4,5  4.5 credits
LAB1  Laboratory work  U,G  1.5 credits

Grades

F, 3, 4, 5

Other information

Supplementary courses

Biomedical Engineering - Project Course (CDIO)
Subject area
Other Subjects within Technology

Disciplinary domain
Medicine

Department
Department of Biomedical Engineering (IMT)

Director of Studies or equivalent
Marcus Larsson

Examiner
Göran Salerud

Education components
Preliminary scheduled hours: 54 h
Recommended self-study hours: 106 h

Course literature

Books
ISBN: 9781420090376, 9781420090369
ISBN: 9780750309387, 0750309385