



PHYSICS

FIM650 Medical Physics, 7.5 higher education credits

Medical Physics, 7,5 högskolepoäng

Second Cycle

Confirmation

This course syllabus was confirmed by Department of Physics on 2008-03-10 and was last revised on 2017-06-13 to be valid from 2017-06-13, spring semester of 2017.

Field of education: Science 100%

Department: Physics

Position in the educational system

The course Medical Physics, 7.5 higher education credits, is a single subject course given within the Physics of materials and biological systems masters program, and is also given as a stand-alone advanced course in physics at the Department of Physics, University of Gothenburg.

The course can be part of the following programmes: 1) Complex Adaptive Systems, Master's Programme (N2CAS), 2) Physics of Materials and Biological Systems, Master's Programme (N2PMB) and 3) Physics, Master's Programme (N2PHY)

Main field of studies

Physics

Specialization

A1F, Second cycle, has second-cycle course/s as entry requirements

Entry requirements

To be eligible for the course basic qualification in linear algebra, program technology and fundamental physics is required.

Applicants must prove knowledge of English: TOEFL test result of at least 600 points (computerized 250 points, on Internet 100 points) or IELTS test result of at least 6.0, including at least 6.5 for the Writing. This requirement does not apply to students with a Bachelor degree from an English speaking university, or to students having passed

English level B at Swedish/Nordic Upper Secondary School.

Learning outcomes

After the course the students are expected to:

- Have gained a broad perspective of how technical innovations based on physical phenomena are applied in medicine.
- Have attained basic knowledge about the most important mathematical image processing algorithms applied within different medical techniques.
- Have achieved deeper acquaintance with a particular technique, with good knowledge about the fundamental physical and technical solutions applied in the technique.
- Being able to perform some of the most fundamental image processing algorithms on medical images.
- Being able to search for information within this particular area.

Course content

Medical physics is a broad science field, why it is difficult to cover the whole field within the frame of this course. Instead the ambition is to present an overview of the area. Thereafter the students will be able to dig deeper into one particular technology, working with a specific project in groups (2–3 students). Examples of different techniques which will be covered by the course are computer tomography, MRI, X-ray, ultrasound, photodynamic therapy, and fluorescence diagnostics. The physical principles behind every method will be covered, as will mathematical image reconstruction and image analysis.

Form of teaching

The examination will be based on the quality of project work, both written report and oral presentation, and the submission of assignments.

Language of instruction: English

Assessment

Grades

The grading scale comprises: Pass with Distinction (VG), Pass (G) and Fail (U). ECTS grades are also given on this course.

Course evaluation

The results of the evaluation will be communicated to the students and will function as a guide for the development of the course.

Additional information

The course is given jointly with Chalmers University of Technology. The Chalmers code for the course is TIF170.