

Module name	Medical Imaging and Processing
Module number	Eul-BMT-C-MBGV
Lecturer in charge	Prof. Dr.-Ing. habil. Hagen Malberg Lehre.IBMT@tu-dresden.de
Objectives	After completing the module, students will have a working knowledge of imaging modalities and their technical implementation and will have skills in the use of image processing software and spatial presentation and interaction tools in the medical and engineering fields. They are able to develop individual components.
Contents	The contents of the module are imaging procedures and devices in medicine, in particular the principles of operation and technical realization of devices and procedures in the medical diagnostic process, such as X-ray diagnostics, CT, MRI, PET, SPECT, US, multimodal data fusion, visualization and quality assessment of diagnostic procedure as a basis for the medical decision-making process and therapeutic measures. Further, the content includes medical image processing, in particular mathematical algorithms for medical image processing and visualization of spatial data, data formats and models of volume data massifs, autostereoscopic presentation and 3D interaction and training in the handling of real multidimensional medical data and images using various software systems.
Modes of teaching and learning	2 hours per week lectures, 1 hour per week seminars, 1 hour per week practical lab course and self-study.
Prerequisites	The knowledge acquired in the modules Physico-chemical Fundamentals of Biomedical Engineering and Radiation Applications in Medicine are required.
Usability	The module is a compulsory module in the main studies of the degree programme Biomedical Engineering. It creates the prerequisites for the modules that list that module in the "Prerequisites" field.
Requirements for the award of credit points	The credit points are awarded when the module assessment is passed. The module assessment consists of a written exam of 90 minutes and a complex assignment of 30 hours. Both exam and complex assignment have to be passed.
Credit points and grades	6 credit points can be obtained by the module. The module grade is the weighted mean of the grades of the assessments. The written exam is weighted by 2/3 and the complex exam is weighted by 1/3.
Frequency	The module is offered every summer semester.
Workload	The total effort is 180 hours.

Duration	The module takes one semester.
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