

Module description: Medical Imaging and Radiation Oncology	
Module Code	t.BA.MI.MBR.23HS
ECTS Credits	4
Language of Instruction/Examination	German
Organizational Unit	IAMP
Module Coordinator	Stephan Scheidegger
Legal Framework	The module description is part of the legal basis in addition to the general academic regulations. It is binding. During the first week of the semester a written and communicated supplement can specify the module description in more detail.
Module Characteristic	Type 3a 2 lecture lessons per semester week and class+ 2 lab bi-weekly lessons per semester and half-class
Module Description	The module Medical Imaging and Radiation Oncology uses highly technology-oriented medical disciplines to demonstrate the application of imaging and technical-therapeutic procedures in the clinical environment. The various imaging modalities will be presented. The terms and technical basics supporting the understanding of the interfaces to medical informatics and hospital IT will be explained. Selected examples show how algorithms and data support quality assurance in imaging diagnostics or the processes in radiation therapy.
Module Content	<ul style="list-style-type: none"> • Introduction to medical imaging and topographic anatomy • Diagnostic ultrasound • MRI • Introduction to ionizing radiation • X-ray technology • Computed Tomography • Image quality and optimization in radiation protection • Introduction to radiation oncology • technology in radiation oncology • Introduction to nuclear medicine
Prerequisite Knowledge	Mathematics 1st Year

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Learning Objectives (Competences)	Students...		Competencies	Taxonomies	
	can explain the main principles and components of the commonly used imaging modalities (Ultraschall, MRI, XR, XRA / XRF, CT, PET, SPECT).		F	K1, K2, K3	
	know the most common clinical applications of medical imaging		F	K1, K2	
	understand the principles and methods of the most common radiation therapy modalities. They understand the specific aspects of the interfaces and the integration of devices and treatment planning systems into the clinical IT infrastructure.		F	K1, K2, K3	
	can depict dedicated clinical applications of quantitative imaging		M, F	K1, K2, K3	
	know the methods for QA and can demonstrate how data analysis and IT can support clinical QA in radiology and radiation oncology		F, M	K1, K2, K3, K5	
	can place the data generated during diagnostics and therapy into a semantic context and know methods for the quantitative evaluation of image data.		M, F	K4	
	know the methods for process planning and optimization of clinical work flows in radiation oncology, and can apply them		F, M	K1, K2, K3	
	know the most common oncological therapies and can explain the important pathological aspects and therapy goals		F	K1	
can illustrate the clinical workflow as well as the data flow in radiation oncology		M, F	K1, K2		
Performance Assessment	End-of-module exam	Assessment	Length (min.)	Weighting	Form
	oral exam	Grade	15	100	acc. to module agreement
	Performance assessment during the semester		Assessment	Length (min.)	Weighting
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Classroom Attendance Requirement	None				
Learning material					
Comments					