



## Subject card

Subject name and code	Neuroimaging with the use of magnetic resonance imaging, PG_00051011						
Field of study	Mechanical and Medical Engineering						
Date of commencement of studies	February 2023		Academic year of realisation of subject		2023/2024		
Education level	second-cycle studies		Subject group				
Mode of study	Full-time studies		Mode of delivery		at the university		
Year of study	1		Language of instruction		Polish		
Semester of study	2		ECTS credits		1.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit							
Name and surname of lecturer (lecturers)	Subject supervisor		Anna Marcinkowska				
	Teachers		Anna Marcinkowska				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	0.0	0.0	15.0	15
	E-learning hours included: 0.0						
Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study plan		Participation in consultation hours		Self-study	SUM
	Number of study hours	15		2.0		8.0	25
Subject objectives	The aim of the course is to present the technique of performing neuroradiological examinations using magnetic resonance imaging. Discussion of basic and advanced methods and techniques of CNS MRI imaging, i.e. perfusion, diffusion tensor imaging, spectroscopy. Presentation of MRI images of the brain from birth to death, and images of CNS diseases, i.e.: trauma, stroke, proliferative, inflammatory, metabolic, neurodegenerative processes. Presentation of the functional neuroanatomy of the brain, as well as the technique of functional research (fMRI).						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K7_U13] He/she uses in-depth knowledge related to the diagnoses techniques and medical procedures in the scope of the field of study of mechanical-medical engineering		She/He can use in-depth knowledge of diagnostic techniques and medical procedures in the field of neuroimaging.		[SU4] Assessment of ability to use methods and tools [SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment		
	[K7_W09] He/she in-depth knowledge related to diagnosis techniques and medical procedures in the scope of the field of study of mechanical-medical engineering		She/He has in-depth knowledge of diagnostic techniques and medical procedures in the field of neuroimaging.		[SW3] Assessment of knowledge contained in written work and projects [SW2] Assessment of knowledge contained in presentation [SW1] Assessment of factual knowledge		
Subject contents	Technique of performing neuroradiological examinations. Issues of sedation. Radiological protection of the staff and the patient and the specificity of work in the MRI laboratory. Basic and advanced methods and techniques of CNS imaging Radiological anatomy of the CNS Brain - from birth to death in MR images , neurodegenerative. Functional neuroanatomy a) Topography of the brain b) General characteristics of the main structures of the brain c) Structural and functional asymmetry of the brain Brain functional examination (fMRI)						
Prerequisites and co-requisites							
Assessment methods and criteria	Subject passing criteria		Passing threshold		Percentage of the final grade		
			60.0%		100.0%		

Recommended reading	Basic literature	Rezonans Magnetyczny W Praktyce Klinicznej Runge V. Urban & Partner, Wrocław 2002Diagnostyka Obrazowa. Mózgowie - A Osborn . MedipageWu-Chung Shen: Diagnostic Neuroradiology : A Practical Guide And Cases, Springer, SingaporeClinical Functional MRI Presurgical Functional Neuroimaging C.Stippich Springer, Nowy Jork, 2007Functional MRI. Asic Principles And Clinical Applications. Faro S., Mohamed F. Springer, Nowy Jork, 2012Obrazowanie Szlaków Istoty Białej Mózgowia: Od Morfologii Do Patologii. Walecki J., Skarzyński H., Szary C. PZWL, Warszawa 2012Neuroradiologia / pod red. Jerzego Waleckiego.
	Supplementary literature	Clinical Functional MRI Presurgical Functional Neuroimaging C.Stippich Springer, Nowy Jork, 2007Functional MRI. Asic Principles And Clinical Applications. Faro S., Mohamed F. Springer, Nowy Jork, 2012Obrazowanie Szlaków Istoty Białej Mózgowia: Od Morfologii Do Patologii. Walecki J., Skarzyński H., Szary C. PZWL, Warszawa 2012Neuroanatomia kliniczna d.L. Tolbert , Janusz Moryś , P.A. Young , P.H. Joung: Edra Urban & Partner 2016
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	Description of the conducted study, fMRI research paradigm used.	
Work placement	Not applicable	