



Subject card

Subject name and code	Diagnostic techniques in medicine, PG_00065009						
Field of study	Mechanical and Medical Engineering						
Date of commencement of studies	February 2025		Academic year of realisation of subject		2024/2025		
Education level	second-cycle studies		Subject group		Obligatory subject group in the field of study Subject group related to scientific research in the field of study		
Mode of study	Full-time studies		Mode of delivery		at the university		
Year of study	1		Language of instruction		Polish		
Semester of study	1		ECTS credits		2.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Institute of Mechanics and Machine Design -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		Michał Penkowski				
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	0.0	0.0	15.0	30
	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	30		6.0		14.0	50
Subject objectives	The aim of the course is to broaden students' knowledge of the main diagnostic techniques used in medicine.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K7_W02] has structured and well-founded knowledge covering fundamental issues in the field of medical sciences allowing to design medical devices, rehabilitation systems and to formulate research procedures		The student has in-depth knowledge of diagnostic techniques used in medicine.		[SW1] Assessment of factual knowledge		
	[K7_U14] integrates information obtained from literature and other properly selected sources, including those in a foreign language, creatively interpreting and critically evaluating them, and drawing conclusions		The student has the ability to prepare and deliver presentations in the field of diagnostic techniques.		[SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment		
	[K7_K13] is ready for responsible performance of professional roles, considering ever-changing need of the society, including self development and supporting and fulfilling work ethics		The student understands the non-technical aspects of the activities of a mechanical engineer and the need to comply with the principles of professional ethics.		[SK3] Assessment of ability to organize work [SK1] Assessment of group work skills		
Subject contents	Theory and technique of CT. Specific applications of CT. Types of blood tests. PET construction. PET scan. Magnetic resonance imaging and its application in diagnostics. The use of diagnostic ultrasonography. Types of transducers, types of presentation, Doppler effect. Electromyography and nerve conduction studies. Endoscopy, laparoscopy, uteroscopy, cystoscopy, gastroscopy, colonoscopy. Elementary analysis of the elements of the body. Intake analysis, calorimetry. Detection of toxins and chemical warfare agents. Identification of bacterial pathogens.						
Prerequisites and co-requisites							
Assessment methods and criteria	Subject passing criteria		Passing threshold		Percentage of the final grade		
	Presentation		60.0%		50.0%		
	Test		60.0%		50.0%		

Recommended reading	Basic literature	<ol style="list-style-type: none"> 1. J. Szabatin. Podstawy teorii sygnałów. WKŁ Warszawa 2003. 2. Problemy biocybernetyki i inżynierii biomedycznej pod red. M. Nałęcza. T.2. Biopomiary. WKiŁ Warszawa 1990. 3. Podstawy biofizyki pod red. A. Pilawskiego. PZWL Warszawa 1985.
	Supplementary literature	<ol style="list-style-type: none"> 1. S. W. Smith. Cyfrowe przetwarzanie sygnałów. Praktyczny poradnik dla inżynierów i naukowców. BTC, Warszawa, 2003. 2. A. Straburzyńska-Lupa, G. Straburzyński. Fizjoterapia. PZWL Warszawa 2003. 3. J. Ross Macdonald. Impedance spectroscopy. Wiley-Interscience 2005.
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	<ol style="list-style-type: none"> 1. Description and explanation of CT. 2. Types of blood testing 3. Types of transducers 4. Doppler effect 5. Uteroscopy 	
Work placement	Not applicable	

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