



Subject card

Subject name and code	Diagnostic techniques in medicine, PG_00057485						
Field of study	Mechanical and Medical Engineering						
Date of commencement of studies	February 2023		Academic year of realisation of subject		2022/2023		
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		Michał Penkowski				
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	3.0		17.0		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_K02] He/she understands outer aspects of influence of mechanical engineer and manager, their social consequences and impact on the environment, needs to follow the rules of ethics and respect for the diversities of views and cultures		The aim of the course is to familiarize students with the main diagnostic techniques used in medicine.		[SK3] Assessment of ability to organize work [SK1] Assessment of group work skills		
	[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		The student has in-depth knowledge of diagnostic techniques used in medicine		[SW1] Assessment of factual knowledge		
	[K7_U03] He/she can prepare an elaboration and presentation related to the general and specific engineering tasks located in Polish and foreign languages		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		
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	