GDAŃSK UNIVERSITY OF TECHNOLOGY

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 2026	Academic year of realisation of subject	2025/2026
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 -> Wydziały Politechniki Gdańskiej		
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_K13] is ready for responsible performance of proffesional roles, considering ever-changing need of the society, including self developement and supporting and fullfiling 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.	[SK1] Assessment of group work skills [SK3] Assessment of ability to organize work
[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.	[SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information
[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

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
Test	60.0%	50.0%
Presentation	60.0%	50.0%

Recommended reading	Basic literature	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	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	
Example issues/ example questions/ tasks being completed	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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