

关。GDAŃSK UNIVERSITY 创 OF TECHNOLOGY

Subject card

Subject name and code	Medical physics, PG_00038733								
Field of study	Medical and Mechanical Engineering, Mechanical and Medical Engineering								
Date of commencement of studies	October 2020		Academic year of realisation of subject			2021/2022			
Education level	first-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	2		Language of instruction			Polish			
Semester of study	4		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							hnology	
Name and surname	Subject supervisor		Jerzy Nowak						
of lecturer (lecturers)	Teachers		Jerzy Nowak						
Lesson types and methods	Lesson type	Lecture	Tutorial	Laboratory	Projec	t	Seminar	SUM	
of instruction	Number of study hours	30.0	0.0	0.0	0.0		0.0	30	
	E-learning hours included: 0.0								
	Address on the e-learning platform: https://enauczanie.pg.edu.pl/moodle/course/view.php?id=14502 Adresy na platformie eNauczanie:								
Learning activity and number of study hours	Learning activity Participation ir classes include plan		ed in study Participation in consultation hours		Self-study SUM		SUM		
	Number of study hours	udy 30 5.0			15.0		50		
Subject objectives	Getting to know the wave and quantum theory of electromagnetic radiation. Understanding the spectrum of E-M radiation with a division into the non-ionizing and ionizing range. Understanding the phenomena of interaction of E-M radiation with matter that are important in medical diagnostics. Discussion of the influence of electromagnetic fields - ionizing and non-ionizing on the human body. Learning about therapeutic methods using E-M radiation. Understanding spectroscopic methods used in atomic, molecular and structural studies of substances.								
Learning outcomes	Course outcome		Subject outcome			Method of verification			
	K6_U11		The student knows the basics of the operation of modern medical equipment - diagnostic and therapeutic			[SU1] Assessment of task fulfilment [SU3] Assessment of ability to use knowledge gained from the subject			
	K6_U01		The student is able to analyze information on modern physics achievements in terms of their use in the design and construction of medical equipment. He knows and understands the trends in the development of medical sciences.			[SU2] Assessment of ability to analyse information			
	K6_W02		The student is able to independently understand the physical basis of the phenomena important in diagnostics and therapy.			[SW1] Assessment of factual knowledge			
Subject contents	Physical fields - types of fields, strength, intensity, and potential. The concept of the electromagnetic field. The wave theory of the electromagnetic field. Direct and alternating currents, radio waves, microwaves, infrared radiation, visible light, ultraviolet. The use of the wave range of radiation in medical techniques. Coulter counter, thermography, electrotherapy. Influence of non-ionizing E-M radiation on the human body. Quantum (photon) theory of E-M radiation. X-rays, gamma rays. Ionizing corpuscular radiation. The use of ionizing radiation in medicine. Fundamentals of radiodiagnostics and nuclear medicine. Basics of radiotherapy. Principles of protection against ionizing radiation. Fundamentals of spectroscopic methods in the structural studies of solids.								

Prerequisites and co-requisites						
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade			
	Final test	60.0%	100.0%			
Recommended reading	Basic literature	 Jaroszyk, Biofizyka, PZWL, Warszawa, 2018 Malicki J., Ślosarek K., Planowanie leczenia i dozymetria w radioterapii, VIA MEDICA, Gdańsk, 2018 Hrynkiewicz A., Fizyczne metody diagnostyki medycznej i terapii, PWN, Warszawa 2013 				
	Supplementary literature					
	eResources addresses					
Example issues/ example questions/ tasks being completed						
Work placement	Not applicable					