



Subject card

Subject name and code	Radiation detectors, PG_00037318						
Field of study	Technical Physics						
Date of commencement of studies	October 2024		Academic year of realisation of subject			2027/2028	
Education level	first-cycle studies		Subject group			Optional subject group 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	4		Language of instruction			Polish	
Semester of study	7		ECTS credits			1.0	
Learning profile	general academic profile		Assessment form			assessment	
Conducting unit	Department of Physics of Electronic Phenomena -> Faculty of Applied Physics and Mathematics -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Grażyna Jarosz				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	0.0	0.0	0.0	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	To acquaint students with the physical foundations of generation and detection of electromagnetic radiation and particle radiation, the design and operation of radiation detectors						
Learning outcomes	Course outcome		Subject outcome			Method of verification	
	[K6_W02] has systematized knowledge of the basics of physics, including mechanics, thermodynamics, electricity and magnetism, optics, atomic and particle physics, solid-state physics, nuclear and elementary particle physics		Knowledge of the interactions of electromagnetic and particle radiation with matter, which are used in detection.			[SW1] Assessment of factual knowledge	
	[K6_W07] has knowledge of the construction and operation of physical instruments, measurement and research equipment		Knows the structure and operating principle of basic photodetectors and ionizing radiation detectors.			[SW1] Assessment of factual knowledge	
Subject contents	Course content – lecture 1. Particles and electromagnetic radiation. 2. Radiation detectors, classification, detectors in biomedical engineering. 3. Noise in detectors. 4. Detector parameters. 5. Detectors of ionizing radiation. 6. Photographic plates. 7. Thermal detectors: bolometers, thermocouples, pyrometers. 8. Thermoemission and scintillation detectors. 9. Polymer photon detectors. 10. X radiation detectors.						
Prerequisites and co-requisites							
Assessment methods and criteria	Subject passing criteria		Passing threshold			Percentage of the final grade	
	Midterm colloquium		51.0%			100.0%	

Recommended reading	Basic literature	J. Godlewski, Generacja i detekcja promieniowania optycznego, PWN Warszawa 2002. Z. Bielecki, A. Rogalski, Detekcja sygnałów optycznych, WNT Warszawa 2001. G. H. Rieke, Detection of Light, Cambridge University Press.
	Supplementary literature	No requirements
	eResources addresses	
Example issues/ example questions/ tasks being completed	1.1. The structure and principle of operation of a vacuum phototube 2. Specify the types of noise in the detectors	
Practical activities within the subject	Not applicable	

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