



Subject card

Subject name and code	Radiation detectors, PG_00037318						
Field of study	Technical Physics						
Date of commencement of studies	October 2026	Academic year of realisation of subject				2029/2030	
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	Presentation of physical fundamentals of radiation detectors						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K6_W04] has advanced knowledge of the principles of experimental design, experimental methods, measurement techniques and scientific equipment used in physics and related sciences, including their life cycle.	Knows the structure and principle of operation of basic photodetectors and ionizing radiation detectors.			[SW1] Assessment of factual knowledge		
	[K6_W02] possesses structured knowledge of the fundamentals of physics, including mechanics, thermodynamics, electricity and magnetism, optics, atomic and molecular physics, solid-state physics, and nuclear and particle physics.	Knows the basic phenomena used in the detection of visible radiation and ionizing radiation.			[SW1] Assessment of factual knowledge		
Subject contents	Course content – lecture Lecture 1. Corpuscular and electromagnetic radiation, sources and effects on the matter. 2. Radiation detectors, classification, detectors in biomedical engineering. 3. Noise detectors. 4. Parameters of detectors. 5. Detectors of corpuscular radiation. 6. Photographic emulsion. 7. Thermal detectors: bolometers, thermocouples, pyroelectric sensors. 8. Scintillation detectors. 9. IR semiconductor photon detectors. 10. VIS and UV semiconductor photon detector. 11. X and gamma detectors for medicine application. 12. X and gamma semiconductor 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	<p>1. J. Godlewski, Generacja i detekcja promieniowania optycznego, PWN Warszawa 2002.</p> <p>2. Z. Bielecki, A. Rogalski, Detekcja sygnałów optycznych, WNT Warszawa 2001.</p> <p>3. S. Tavernier, A. Gektin, B. Grinyov, W. Moses, Radiation Detectors for Medical Applications, Springer 2006.</p>
	Supplementary literature	<p>1. G. H. Rieke, Detection of Light, Cambridge Univ. Press</p> <p>2. M. Nałęcz (pod red.), Biocybernetyka i inżynieria biomedyczna 2000, t.2, Biopomiary, Akademicka Oficyna Wydawnicza EXIT, Warszawa 2002.</p>
	eResources addresses	
Example issues/ example questions/ tasks being completed	Classification of radiation detectors	
Practical activities within the subject	Not applicable	

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