GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Radiation detectors, PG_00037318		
Field of study	Technical Physics		
Date of commencement of studies	October 2023	Academic year of realisation of subject	2026/2027
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_W07] Has knowledge of the construction and operation of physical instruments, measurement and research equipment.	Possesses structured knowledge of the structure and principle of operation of photodetectors and ionizing radiation detectors	[SW1] Assessment of factual knowledge
[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.	Possesses structured knowledge of the interaction of electromagnetic radiation and corpuscular radiation, which are the basis for radiation detection.	[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.Construction and principle of operation of the ionization chamber. 2. Specify the types of noise in the detectors	
Practical activites within the subject	Not applicable	

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