



## Subject card

Subject name and code	Radiation detectors, PG_00053366						
Field of study	Biomedical Engineering, Biomedical Engineering, Biomedical Engineering						
Date of commencement of studies	February 2023	Academic year of realisation of subject			2023/2024		
Education level	second-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	1	Language of instruction			Polish		
Semester of study	2	ECTS credits			2.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Instytut Fizyki i Informatyki Stosowanej -> Faculty of Applied Physics and Mathematics						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Grażyna Jarosz				
	Teachers		dr hab. inż. Grażyna Jarosz				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	15.0	0.0	0.0	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		2.0		18.0	50
Subject objectives	To acquaint students with the construction and principles of operation of e-m radiation detectors						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K7_U06] can analyse the operation of components, circuits and systems related to the field of study; measure their parameters; examine technical specifications; interpret obtained results and draw conclusions		can measure radiation parameters		[SU5] Assessment of ability to present the results of task		
[K7_W02] Knows and understands, to an increased extent, selected laws of physics and physical phenomena, as well as methods and theories explaining the complex relationships between them, constituting advanced general knowledge in the field of technical sciences related to the field of study		knows the physical basics of radiation detection		[SW1] Assessment of factual knowledge			
Subject contents	1. Electromagnetic radiation, sources and interaction with matter. 2. Thermal radiation. 3. Radiation detectors, classification. 4. Detector noise. 5. Detector parameters. 6. Detectors of ionizing radiation. 7. Photographic plates. 8. Thermal detectors: bolometers, thermocouples, pyrometers. 9. Thermo-emission and scintillation detectors. 10. Semiconductor photon detectors. 11. CCD matrices. 12. X-ray and gamma-ray detectors used in medicine. laboratory 1. Investigation of the p-n photodiode 2. Investigation of the radiation thermostat. 3. Examination of the scintillation detector.						
Prerequisites and co-requisites							
Assessment methods and criteria	Subject passing criteria		Passing threshold		Percentage of the final grade		
			100.0%		30.0%		
			51.0%		70.0%		
Recommended reading	Basic literature		G.H. Rieke, Detection of Light, Cambridge University Press				
	Supplementary literature		G.H. Rieke, Detection of Light, Cambridge University Press				

	eResources addresses	Adresy na platformie eNauczenie: Detektory promieniowania 2023/2024 - Moodle ID: 34013 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=34013">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=34013</a>
Example issues/ example questions/ tasks being completed	Give the types of noises in the detectors	
Work placement	Not applicable	