



## Subject card

Subject name and code	, PG_00051807						
Field of study	Technical Physics						
Date of commencement of studies	February 2026		Academic year of realisation of subject		2026/2027		
Education level	second-cycle studies		Subject group		Obligatory subject group 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	Division of Physics of Organic and Perovskite Photovoltaic Structures -> Institute of Physics and Applied Computer Science -> Faculty of Applied Physics and Mathematics -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Damian Głowienka				
	Teachers		dr inż. Damian Głowienka				
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	30.0	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		3.0		17.0	50
Subject objectives	The course aims to develop skills in measuring and analyzing JV characteristics of various types of solar cells and in the fabrication of dye-sensitized solar cells.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K7_U03] has enhanced laboratory work experience		The student has advanced skills in operating research equipment and applying solar cell fabrication techniques, in accordance with health and safety regulations and good laboratory practice.		[SU4] Assessment of ability to use methods and tools		
	[K7_K03] can communicate and present results of own work and transfer information in a commonly understandable manner		The student is able to compile and present results in the form of a scientific report.		[SK4] Assessment of communication skills, including language correctness		
	[K7_W06] has enhanced knowledge of the experimental methods and techniques applied in physics		The student has an advanced understanding of experimental methods and techniques used in the fabrication of solar cells.		[SW1] Assessment of factual knowledge		
	[K7_W05] knows the theoretical basis of the functioning of physical scientific equipment		The student understands the theoretical foundations of scientific instrumentation and has mastered the operating principles of the instruments used for the fabrication and characterization of solar cells.		[SW1] Assessment of factual knowledge		
Subject contents	Course content – laboratory 1. Preparation of the list of required tests and planning of the experimental process in accordance with the research objective. 2. Conducting the fabrication process of dye-sensitized solar cells. 3. Performing electrical measurements. 4. Analyzing the results and drawing conclusions. 5. Preparing a written report.						

Prerequisites and co-requisites	Knowledge of the fundamental physical phenomena occurring in solar cells. Theoretical knowledge of the basic principles of solar cell operation and fabrication technology is also required. In addition, the student should be able to carry out measurements of electrical quantities, analyze them, and present the results.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Evaluation of a written report on the course of research and its results.	50.0%	100.0%
Recommended reading	Basic literature	[1] W. Shockley, H. Queisser, Detailed balance limit of efficiency of pn junction solar cells, Journal of Applied Physics 32 (2) (1961) 510-518.  [2] P. Würfel, Physics of Solar Cells From Principles to New Concepts, WILEY-VCH Verlag GmbH & Co. KGaA, Weinheim 2005.	
	Supplementary literature	1. Handbook of photovoltaic science and engineering, ed. by Antonio Luque and Steven Hegedus, 2011 John Wiley & Sons, Ltd	
	eResources addresses		
Example issues/ example questions/ tasks being completed	1. Preparation of the list of required tests and planning of the experimental process in accordance with the research objective. 2. Conducting the fabrication process of dye-sensitized solar cells. 3. Performing electrical measurements. 4. Analyzing the results and drawing conclusions. 5. Preparing a written report.		
Practical activities within the subject	Not applicable		

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