



Subject card

Subject name and code	Dielectrics, PG_00045527						
Field of study	Nanotechnology						
Date of commencement of studies	October 2022	Academic year of realisation of subject			2022/2023		
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			English		
Semester of study	2	ECTS credits			2.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Zakład Elektrochemii i Fizykochemii Powierzchni -> Instytut Nanotechnologii i Inżynierii Materiałowej -> Faculty of Applied Physics and Mathematics						
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Natalia Wójcik					
	Teachers	dr hab. inż. Natalia Wójcik					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	0.0	0.0	15.0	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	0.0		0.0	30	
Subject objectives	Learning about modern dielectric materials and technological issues related to their application.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	K7_W03	The student knows the theoretical basis of dielectric science. The student proposes the basic methods of testing the properties of dielectric materials.			[SW1] Assessment of factual knowledge		
	K7_W02	The student knows the basic application of modern dielectric materials.			[SW1] Assessment of factual knowledge		
	K7_U10	The student presents the studied topic with particular emphasis on the electrical properties of dielectrics and their modern applications.			[SU5] Assessment of ability to present the results of task		
	K7_W09	The student knows the terminology describing the electrical properties of dielectrics.			[SW1] Assessment of factual knowledge		
Subject contents	<ul style="list-style-type: none">• Electrical properties of dielectrics - basic concepts. Macroscopic properties of dielectrics.• Electrical properties of dielectrics - dielectric polarization mechanisms• Mechanisms of electrical conduction in dielectrics• Dielectric in an alternating electric field - description in the frequency domain.• Dielectric in alternating electric field - time domain description.• Measurements of electrical parameters of dielectrics• Impedance spectroscopy in practice• Dielectrics with special properties• Basic applications of dielectrics.						
Prerequisites and co-requisites							

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	seminar	50.0%	50.0%
	test	50.0%	50.0%
Recommended reading	Basic literature	<ul style="list-style-type: none"> Dielectric Relaxation in Solids, Andrzej K. Jonscher, Chelsea Dielectrics Press, 1983. 	
	Supplementary literature	N/A	
	eResources addresses	Adresy na platformie eNauczanie: Dielectrics - Moodle ID: 29202 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=29202	
Example issues/ example questions/ tasks being completed	Explain the mechanism of orientational polarization.		
Work placement	Not applicable		