



Subject card

Subject name and code	Thin film technologies, PG_00058947						
Field of study	Technologie cienkowarstwowe						
Date of commencement of studies	October 2023		Academic year of realisation of subject		2025/2026		
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	3		Language of instruction		Polish		
Semester of study	5		ECTS credits		4.0		
Learning profile	general academic profile		Assessment form		exam		
Conducting unit	Institute of Nanotechnology and Materials Engineering -> Faculty of Applied Physics and Mathematics -> Wydział Politechniki Gdańskiej						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Marcin Łapiński				
	Teachers		dr hab. inż. Marcin Łapiński dr inż. Piotr Okoczuk				
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	30.0	0.0	0.0	45
	E-learning hours included: 0.0						
	eNauczanie source addresses: Moodle ID: 2133 Technologie cienkowarstwowe https://enauczanie.pg.edu.pl/2025/course/view.php?id=2133						
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	45		5.0		50.0	100
Subject objectives	The aim of the course is to give information with the techniques (both, production and analysis) used in thin-film technology.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	K6_W06		The student has theoretical bacground, especially including knowledge of the basics of thermodynamics, crystallography and chemistry		[SW1] Ocena wiedzy faktograficznej [SW3] Ocena wiedzy zawartej w opracowaniu tekstowym i projektowym		
	K6_U10		The student is able to plan and conduct an experiment, paying particular attention to energy consumption and other environmental aspects.		[SU1] Ocena realizacji zadania [SU4] Ocena umiejętności korzystania z metod i narzędzi		
	K6_W05		The student is able to solve scientific and technological problems related to thin films		[SW3] Ocena wiedzy zawartej w opracowaniu tekstowym i projektowym [SW1] Ocena wiedzy faktograficznej		
	K6_U06		The student knows the techniques of manufacturing and analyzing thin films. Has the necessary theoretical knowledge and uses professional terminology.		[SU2] Ocena umiejętności analizy informacji [SU3] Ocena umiejętności wykorzystania wiedzy uzyskanej w ramach przedmiotu [SU5] Ocena umiejętności zaprezentowania wyników realizacji zadania		

Subject contents	Lecture		
	1. Nanothermodynamics, 2. Manufacturing of the thin films, 3. Properties 4. Analysis of the thin films 5. Applications		
	Laboratory:		
	Planning the experiment and deposition of thin metallic films using two PVD methods and an oxide layer using the CVD method. Measurement of their mechanical and optical properties.		
Prerequisites and co-requisites	Passed the exam in the listed below subjects		
	Technologie Otrzymywania Nanomateriałów		
	Fizyczne Metody Badań Materiałów		
	Termodynamika		
	Krystalografia		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	lab report	51.0%	40.0%
	exam	51.0%	60.0%
Recommended reading	Basic literature	Books and papers. Like eg. Krishna Seshan, "Handbook of Thin Film Deposition" Hartmut Frey, "Handbook of Thin Film Technology" Stine, Keith J. "Materials Processing for Production of Nanostructured Thin Films",	
	Supplementary literature	Technological news from journals	
	eResources addresses		
	Example issues/ example questions/ tasks being completed	Design of a photochromic coating for eyeglass lenses	
Examination of the properties of an ultrathin dielectric layer			
Seeding thin gold layers on various substrates			
Practical activities within the subject	Not applicable		

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