



Subject card

Subject name and code	Thin film technologies, PG_00058947						
Field of study	Nanotechnology						
Date of commencement of studies	October 2022	Academic year of realisation of subject			2024/2025		
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						
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Marcin Łapiński					
	Teachers	dr hab. inż. Marcin Łapiński dr inż. Marta Prześniak-Welenc					
Lesson types and methods of instruction	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							
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_W05	The student is able to solve scientific and technological problems related to thin films			[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects		
	K6_U10	The student is able to plan and conduct an experiment, paying particular attention to energy consumption and other environmental aspects.			[SU4] Assessment of ability to use methods and tools [SU1] Assessment of task fulfilment		
	K6_W06	The student has theoretical background, especially including knowledge of the basics of thermodynamics, crystallography and chemistry			[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge		
K6_U06	The student knows the techniques of manufacturing and analyzing thin films. Has the necessary theoretical knowledge and uses professional terminology.			[SU5] Assessment of ability to present the results of task [SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information			

Subject contents	1. Nanothermodynamics, 2. Manufacturing of the thin films, 3. Properties 4. Analysis of the thin films 5. Applications		
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
	exam	51.0%	60.0%
	lab report	51.0%	40.0%
Recommended reading	Basic literature	Polis and English books and papers. Like eg. Krishna Seshan, "Handbook of Thin Film Deposition" Hartmut Frey, "Handbook of Thin Film Technology"	
	Supplementary literature	Technological news from journals	
	eResources addresses	Adresy na platformie eNauczenie: Technologie cienkowarstwowe - Moodle ID: 41767 https://enauczenie.pg.edu.pl/moodle/course/view.php?id=41767	
Example issues/ example questions/ tasks being completed	Opisz metodę wytwarzania ultracienkich warstw. Wyjaśnij na czym polega efekt fotochromowy		
Work placement	Not applicable		

Document generated electronically. Does not require a seal or signature.