GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	, PG_00052106		
Field of study	Nanowarstwy i nanopowłoki		
Date of commencement of studies	October 2022	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	4	Language of instruction	Polish
Semester of study	7	ECTS credits	4.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Division of Nanomaterials Physics -> Institute of Nanotechnology and Materials Engineering -> Faculty of Applied Physics and Mathematics -> Wydziały Politechniki Gdańskiej		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Marcin Łapiński	
	Teachers	dr hab. inż. Marcin Łapiński	

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	0.0	0.0	15.0	30.0	0.0	45

E-learning hours included: 0.0

eNauczanie source addresses:

Moodle ID: 2054 Nanowarstwy i nanopowłoki
https://enauczanie.pg.edu.pl/2025/course/view.php?id=2054

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 familiarize students with fabrication techniques and methods used for the analysis of surface, structure, as well as optical and electrical properties applied in thin-film technology. Special attention will be given to the use of thin films in modern medical and analytical technologies

Learning outcomes

Course outcome	Subject outcome	Method of verification
K6_W07	The student has theoretical bacground, especially including knowledge of the basics of thermodynamics, crystallography and chemistry	[SW3] Ocena wiedzy zawartej w opracowaniu tekstowym i projektowym [SW1] Ocena wiedzy faktograficznej
K6_U02	The student is able to solve scientific and technological problems related to thin films	[SU5] Ocena umiejętności zaprezentowania wyników realizacji zadania [SU2] Ocena umiejętności analizy informacji [SU1] Ocena realizacji zadania
K6_K04	The student is able to lead the work of a team designing a device and has sufficient competence to take on the role of an expert	[SK5] Ocena umiejętności rozwiązywania problemów występujących w praktyce [SK4] Ocena umiejętności komunikacji, w tym poprawności językowej [SK3] Ocena umiejętności organizacji pracy [SK2] Ocena postępów pracy [SK1] Ocena umiejętności pracy w grupie
K6_U09	The student is able to plan and conduct an experiment, paying particular attention to energy consumption and other environmental aspects	[SU2] Ocena umiejętności analizy informacji [SU3] Ocena umiejętności wykorzystania wiedzy uzyskanej w ramach przedmiotu [SU1] Ocena realizacji zadania

<table>
<tr><td>Subject contents</td><td>Laboratories classes:
1. Overview of basic thin film manufacturing methods,
2. Measurement and analysis of properties of the metallic thin films,
Project classes:
1. Applications of thin films in medicine and analytics
2. Design of a sensor based on thin film technology,</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>Basic knowledge of thermodynamics, crystallography, as well as physics and chemistry</td></tr>
<tr><td>Assessment methods and criteria</td><td>
<table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>project presentation</td><td>51.0%</td><td>50.0%</td></tr>
<tr><td>lab report</td><td>51.0%</td><td>50.0%</td></tr>
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<tr><td>Recommended reading</td><td>
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<tr><td>Basic literature</td><td>Books and papers. Like eg.

1. Krishna Seshan, "Handbook of Thin Film Deposition"
2. Hartmut Frey, "Handbook of Thin Film Technology"
3. Catherine Picart et al. "Layer-by-layer films for biomedical applications"</td></tr>
<tr><td>Supplementary literature</td><td>Technological news from journals</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
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<tr><td>Example issues/ example questions/ tasks being completed</td><td>Design of a biosensor based on thin-film technology

Fabrication of a biocompatible thin film</td></tr>
<tr><td>Practical activites within the subject</td><td>Not applicable</td></tr>
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