GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Experimental nanotechnology, PG_00063958		
Field of study	Nanotechnology		
Date of commencement of studies	October 2025	Academic year of realisation of subject	2025/2026
Education level	second-cycle studies	Subject group	Specialty 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	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	mgr inż. Piotr Okoczuk dr hab. inż. Marcin Łapiński	

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

Teaching of selected experimental methods used in nanotechnology. Especially in the field of synthesis and study of the properties of nanostructures.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_W04] has practical and theoretical knowledge of physical and chemical experimental methods of nanotechnology.	The student is able to describe chemical and physical methods of manufacturing of nanomaterials	[SW1] Assessment of factual knowledge
[K7_W06] Has extended knowledge on the methodology of physics laboratory work, supported with experience in laboratory work. Knows the rules of occupational health and safetyto a degree sufficient for independent work at a research and measuring position.	The student is able to plan and safely carry out experiment	[SW1] Assessment of factual knowledge
[K7_W07] has extended knowledge concerning potential negative biological and ecological effects resulting from using nanostructures and relevant safety rules.	The student is able to plan and safely carry out experiment. Can predict the risks associated with working with nanostructures.	[SW1] Assessment of factual knowledge
[K7_U05] can plan and conduct experimental and critical research and analyze their results, draw conclusions and formulate reasoned conclusions – within their specialization.	The student can listed and described chemical and physical methods of manufacturing of nanomaterials.Choose proper measurement method for testing of nanomaterials.	[SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject

<table>
<tr><td>Subject contents</td><td>Measurements methods:

- microscopic methods,

- structural methods and analysis of chemical composition,

- spectroscopic methods with especially luminescence measurements,

Properties of nanomaterials. Manufacturing of plasmonic platforms and luminescence glasses.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>Synthesis methods of nanomaterials (NAN2A006)</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>laboratory</td><td>51.0%</td><td>33.33%</td></tr>
<tr><td>lecture</td><td>51.0%</td><td>66.67%</td></tr>
</table></td></tr>
<tr><td>Recommended reading</td><td><table>
<tr><td>Basic literature</td><td>Nanostructures and Nanomaterials. Synthesis, Properties and Applications. Imperial College Press. Guozhong Gao. 2004.

Nanoscale Science and Technology, Wiley, Robert Kelsall (Editor), Ian W. Hamley (Co-Editor), Mark Geoghegan (Co-Editor).</td></tr>
<tr><td>Supplementary literature</td><td>Introduction to Nanotechnology. Ch. P. Poole Jr., F. J. Owens. Wiley. 2003.

Nanoelectronics and Information Technology. Adv.Electronic Materials and Novel Devices. Reiner Waser (Ed.) Wiley-VCH. 2003.</td></tr>
<tr><td>eResources addresses</td><td>Adresy na platformie eNauczanie:</td></tr>
</table></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td>Synthesis methods of thin films of luminescent materials.

Masurements methods of the properties of glasses and thin oxide layers</td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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