GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	, PG_00058865		
Field of study	Nanotechnology		
Date of commencement of studies	October 2023	Academic year of realisation of subject	2024/2025
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	2	Language of instruction	English
Semester of study	4	ECTS credits	25.0
Learning profile	general academic profile	Assessment form	assessment
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. Agnieszka Witkowska	
	Teachers	dr hab. inż. Agnieszka Witkowska	

Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	0.0	165.0	0.0	165
	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	165	30.0	430.0	625

Subject objectives	Preparation of the Student for undertaking and solving scientific and technical problems as well as for elaborating complete and reliable research reports.

Learning outcomes

Course outcome	Subject outcome	Method of verification
K7_K04	The student starts working on the diploma project as early as on the third semester of study and implementing it by the end of the fourth semester gains experience and skills related to planning and organizing systematic work on a long-term scientific-technical problem/project.	[SK3] Assessment of ability to organize work
K7_W06	The student has an extended knowledge needed to work in a physical laboratory, to carry out research, measurements and engineering work related to the diploma project tasks.	[SW1] Assessment of factual knowledge
K7_W07	By implementing a Master's project in the field of nanomaterials and nanotechnology, the student expands his/her knowledge of the potential negative biological and ecological effects associated with the use of nanostructures, as well as of the related safety principles.	[SW1] Assessment of factual knowledge
K7_U06	By implementing a master's project and preparing a master's thesis, the student (in accordance with the scope of the project and assigned tasks) acquires the ability to perform theoretical and numerical calculations and simulations of phenomena and processes, as well as critically analyze their results, draw conclusions and formulate reasoned opinions.	[SU4] Assessment of ability to use methods and tools [SU2] Assessment of ability to analyse information
K7_U01	The student, while preparing the master's project, as part of the assigned tasks, performs a review of scientific literature related to the implemented project and conducts a critical discussion of the obtained results based on available sources and databases. He acquires the ability to critically analyze and select information from properly selected sources (in English).	[SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment
K7_K09	Performing the diploma project the Student undertaks various engineering and research activities necessary to perform a physical or numerical experiment, thus the student gains an awareness of the importance and impact of the effects of their activities on the environment and the associated responsibility for decisions.	[SK3] Assessment of ability to organize work [SK5] Assessment of ability to solve problems that arise in practice
K7_U10	The master's thesis is completed by presenting the main tasks, the results of one's own research and conclusions resulting from the project during the final diploma exam. Therefore, the student has a deepened ability to prepare such an oral presentation in English.	[SU5] Assessment of ability to present the results of task
K7_U05	By implementing a master's project and preparing a master's thesis, the student (in accordance with the scope of the project and assigned tasks) acquires the ability to plan and conduct experimental research and critically analyze their results, draw conclusions and formulate reasoned opinions.	[SU4] Assessment of ability to use methods and tools [SU2] Assessment of ability to analyse information

<table>
<tr><td>Subject contents</td><td>Implementation of research tasks related to the selected topic of the diploma project in the team: student-project supervisor.

Preparation of the MSc thesis manuscript in accordance with suitable standards and general guidelines.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>Completed and passed all courses from semesters 1-3.</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>Preparation and presentation of the MSc thesis</td><td>50.0%</td><td>50.0%</td></tr>
<tr><td>Realization of laboratory tasks related to the diploma project</td><td>100.0%</td><td>50.0%</td></tr>
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<tr><td>Recommended reading</td><td>
<table>
<tr><td>Basic literature</td><td>[1] Nicholas Walliman, Research Methods, The Basics, Taylor & Francis Group, London and New York, 2011

[2] Hugh G. Gauch Jr., Scientific Methods in Brief, Cambridge University Press, 2012</td></tr>
<tr><td>Supplementary literature</td><td>[1] Guidelines for Authors of diploma thesis and diploma projects for higher education studies at Gdańsk University of Technology written in polish or english.

[2] Scientific literature and specialist reports related to the diploma project</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>1. Optimization of dealloying process in the formation of porous nanoparticles of gold
2. Non-stoichiometric electrodes with exsolved catalytically active oxide nanoparticles
3. Optimization of the fuel cell manufacturing process through the use of 3D printing
4. Quantum-chemical investigations of the generations of reactive oxygen species by titanium dioxide</td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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