GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	, PG_00058875		
Field of study	Nanotechnology		
Date of commencement of studies	October 2022	Academic year of realisation of subject	2022/2023
Education level	first-cycle studies	Subject group	Obligatory subject group in the field of study 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	Polish
Semester of study	2	ECTS credits	2.0
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 dr hab. inż. Aleksandra Mielewczyk-Gryń dr hab. inż. Beata Bochentyn dr inż. Magdalena Jażdżewska dr hab. inż. Jacek Ryl prof. dr hab. inż. Maria Gazda prof. dr hab. inż. Tomasz Klimczuk dr inż. Beata Majkowska-Marzec dr hab. inż. Marcin Łapiński dr inż. Michał Bartmański dr hab. inż. Jakub Karczewski dr hab. inż. Leszek Piotrowski dr inż. Leszek Wicikowski dr hab. Maciej Bobrowski dr hab. inż. Natalia Wójcik	

Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	0.0	0.0	0.0	30
	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	30	2.0	18.0	50

Subject objectives	The aim of the subject is to provide students with selected issues in nanotechnology, which are studied by the scientists form Institute of Naotechnology and Materials Engineerng and research employees conducting classes with NT students. Students interested in a given subject have the opportunity to join scientific work of research teams or cooperate with researchers as part of their various activities, including popular science, engineering and teaching activities.

Learning outcomes

Course outcome	Subject outcome	Method of verification
K6_U01	Inspired by the selected issues presented in the classes, the student learns on his own, obtains information and broadens his knowledge in the field of nanotechnology and materials engineering using professional literature, databases and other appropriately selected sources, often suggested and recommended by lecturers.	[SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information
K6_W01	The presentation of various aspects of nanotechnology (theory, basic knowledge and practical applications) and research methods used in nanotechnology will make the student understand the key role of the development of physics, nanotechnology and materials engineering in the progress of civilization.	[SW1] Assessment of factual knowledge

Subject contents

1. Introduction

2. Conductive nanoceramics

3. Nano in thermoelectric cells

4. Catalytic properties of electrochemical devices

5. Advanced magnetic and electronic materials

6. Computer simulations of nanosystems

7. Polymers on liquids

8. Applications of nanostructures in the production of medical implants, diagnostics and treatment

9. Glass and glass-ceramic composites for bone implants

10. Domain structure - methods of its imaging

11. Nanostructures of oxide fuel cells

12. Application of nanostructures in macromolecular recognition tools

13. Plasmonic nanostructures

14. Unusual but common applications of nanotechnology

15. Synchrotron radiation in nanotechnology

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Test/survey	100.0%	50.0%
Participation in classes	50.0%	50.0%

Recommended reading	Basic literature	Nanotechnologie. Red. Nauk. R.W.Kelsall i in. PWN 2008.
	Supplementary literature	Takaaki Tsurumi et al. Nanoscale physics for materials science, CRC Press.
	eResources addresses	Adresy na platformie eNauczanie: Wybrane zagadnienia nanotechnologii 2023 - Moodle ID: 27234 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=27234
Example issues/ example questions/ tasks being completed	Plasmon resonance occures in (choose the correct answer): a) metals; b) dielectrics; c) superconductors; d) semiconductors. List the most important properties of synchrotron radiation. What other issues, not covered during these classes, in the field of nanotechnology, designing new nanomaterials, or the applications of nanomaterials are you interested in?	
Work placement	Not applicable	

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