



Subject card

Subject name and code	NANOTECHNOLOGY, PG_00063190						
Field of study	NANOTECHNOLOGIA						
Date of commencement of studies	February 2026		Academic year of realisation of subject		2025/2026		
Education level	second-cycle studies		Subject group		Obligatory subject group 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	1		ECTS credits		5.0		
Learning profile	general academic profile		Assessment form		exam		
Conducting unit	Department of Inorganic Chemistry -> Faculty of Chemistry -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Andrzej Okuniewski				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	15.0	30.0	0.0	60
	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	60		5.0		60.0	125
Subject objectives	The aim of the course is to acquaint students with the history, present state and future prospects of nanotechnology - an interdisciplinary field combining achievements in physics, chemistry, biology, material science, and many others. Awareness of technological capabilities at the nanoscale will give future graduates a chance to use them in their work.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K7_U01] designs experiments using computer methods of data analysis, computer simulations and based on the state of the knowledge in accordance with the latest scientific literature		The student is able to plan and conduct computer simulations to design nanostructures, analyze their properties, and investigate nanoscale phenomena. As part of the computer project, the student selects appropriate modeling methods and verifies the obtained results against the scientific literature.		[SU4] Ocena umiejętności korzystania z metod i narzędzi [SU3] Ocena umiejętności wykorzystania wiedzy uzyskanej w ramach przedmiotu [SU1] Ocena realizacji zadania		
	[K7_W03] selects methods of data analysis, including statistical and modelling, useful for solving scientific and technological problems		The student can identify and choose suitable computational methods and data analysis techniques to solve specific nanotechnology-related problems. They understand the principles and limitations of each method and can evaluate the suitability of a given method for a particular problem.		[SW3] Ocena wiedzy zawartej w opracowaniu tekstowym i projektowym [SW1] Ocena wiedzy faktograficznej		
	[K7_U09] prepares documentation of experiments and technological processes using professional terminology		The student is able to prepare reports on the laboratory experiments and project work carried out. They describe synthesis and characterization processes of nanostructures using proper nanotechnology terminology.		[SU5] Ocena umiejętności zaprezentowania wyników realizacji zadania		

Subject contents	Course content – lecture Lecture: Molecular modeling. History of nanotechnology. Nanolithography. Nanoelectronics. Computer data storage. Structural research. Coordination and supramolecular chemistry. Carbon nanostructures. Quantum effects in nanostructures. 0-3D nanostructures. Calculation exercises. Project: Students become acquainted with the basics of molecular modeling and design nanodevices by themselves. Laboratories: Students synthesise selected nanostructures and examine their properties. A detailed program of the course as well as the project and laboratory are regularly updated and posted on the eNauczanie platform.		
Prerequisites and co-requisites	Completed courses at the undergraduate level in the following subjects: mathematics, physics, general, inorganic, organic and physical chemistry.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Laboratory	60.0%	30.0%
	Exam	60.0%	40.0%
	Project	60.0%	30.0%
Recommended reading	Basic literature	• R. W. Kelsall, I. W. Hamley, M. Geoghegan: Nanotechnologie. <i>Wydawnictwo Naukowe PWN</i>, Warszawa 2008. • Ch. P. Poole Jr., F. J. Owens: Introduction to Nanotechnology. <i>Wiley-Interscience Hoboken</i>, New Jersey 2003. • B. Dręczewski, A. Herman, P. Wroczyński: Nanotechnologia stan obecny i perspektywy, <i>Wydawnictwo PG</i>, Gdańsk 1997.	
	Supplementary literature	• K. Żelechowska: Nanotechnologia w chemii i medycynie. <i>Wydawnictwo PG</i>, Gdańsk 2014. • E. Regis: Nanotechnologia. Narodziny nowej nauki, czyli świat cząsteczka po cząsteczce. <i>Prószyński i S-ka</i>, Warszawa 2001.	
	eResources addresses		
Example issues/ example questions/ tasks being completed	Available on the eNauczanie platform.		
Practical activities within the subject	Not applicable		

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