



Subject card

Subject name and code	Experimental Nanotechnology , PG_00057511						
Field of study	Nanotechnology						
Date of commencement of studies	February 2024	Academic year of realisation of subject				2023/2024	
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	1	Language of instruction				Polish	
Semester of study	1	ECTS credits				3.0	
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						
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Marcin Łapiński					
	Teachers						
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		2.0		28.0	75
Subject objectives	Overview of selected experimental methods used in nanotechnology in the field of synthesis and research properties .						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	K7_U02	The student is able to plan and perform out experiment			[SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject		
	K7_K09	The student is able to plan the process of manufacturing nanomaterials.			[SK2] Assessment of progress of work		
	K7_W07	The student is able to plan and safety perform experiment			[SW1] Assessment of factual knowledge		
	K7_U05	Student is able to list and describe the chemical and physical methods of the production of nanomaterials.			[SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject		
	K7_W04	Student is able to describe the physical and chemical methods of the nanomaterials manufacturing.			[SW1] Assessment of factual knowledge		

Subject contents	<p>The properties of nanomaterials and structure sizes.</p> <p>Methods of preparation :</p> <ul style="list-style-type: none"> <li>- Methods of bottom-up , top-down,</li> <li>- Methods of preparation of 0D, 1D, 2D, 3D structures ,</li> </ul> <p>Methods of study:</p> <ul style="list-style-type: none"> <li>- Microscopic methods ,</li> <li>- Methods of structure studies,</li> <li>- Spectroscopic methods, especially luminescence measurements.</li> </ul>											
Prerequisites and co-requisites	<p>The physical basis of nanotechnology - NAN1B007</p> <p>Physical chemistry of surfaces - NAN1B016</p>											
Assessment methods and criteria	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 40%;">Subject passing criteria</th> <th style="width: 30%;">Passing threshold</th> <th style="width: 30%;">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td>laboratory assessment</td> <td>80.0%</td> <td>40.0%</td> </tr> <tr> <td>Examination of the lecture</td> <td>60.0%</td> <td>60.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	laboratory assessment	80.0%	40.0%	Examination of the lecture	60.0%	60.0%
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Recommended reading	<p>Basic literature</p>	<p>Nanostructures and Nanomaterials. Synthesis, Properties and Applications. Imperial College Press. Guozhong Gao. 2004.</p> <p>Introduction to Nanotechnology. Ch. P. Poole Jr., F. J. Owens. Wiley. 2003.</p> <p>Nanoelectronics and Information Technology. Adv. Electronic Materials and Novel Devices. Reiner Waser (Ed.) Wiley-VCH. 2003.</p>										
	<p>Supplementary literature</p>	<p>Introduction to Nanotechnology. Ch. P. Poole Jr., F. J. Owens. Wiley. 2003.</p> <p>Nanoelectronics and Information Technology. Adv. Electronic Materials and Novel Devices. Reiner Waser (Ed.) Wiley-VCH. 2003.</p>										
	<p>eResources addresses</p>	<p>Adresy na platformie eNauczanie:</p>										
Example issues/ example questions/ tasks being completed	<p>Methods of synthesis of luminescence thin films.</p> <p>Methods of test properties of glasses and oxide thin films.</p>											
Work placement	<p>Not applicable</p>											

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