



Subject card

Subject name and code	Microscopic Imaging Techniques for Bionanomaterials, PG_00069342						
Field of study	Nanotechnology						
Date of commencement of studies	October 2025	Academic year of realisation of subject			2026/2027		
Education level	first-cycle studies	Subject group					
Mode of study	Full-time studies	Mode of delivery			at the university		
Year of study	2	Language of instruction			Polish		
Semester of study	4	ECTS credits			1.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Division of New Functional Materials For Energy Conversion -> Institute of Nanotechnology and Materials Engineering -> Faculty of Applied Physics and Mathematics -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Jakub Karczewski					
	Teachers	dr hab. inż. Jakub Karczewski					
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	15.0	0.0	0.0	15
	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	15		1.0		9.0	25
Subject objectives	The aim of the course is to familiarize students with the methodology and specifics of preparing biological samples for imaging using various microscopic methods.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K6_W09] Has knowledge of the structure and operation of scientific instruments, measuring and test equipment and in the field of planning and conducting a physical experiment and critical analysis of its results.	The student knows and understands the principles of operation and is able to perform measurements using optical microscopy, SEM and AFM.			[SW1] Assessment of factual knowledge		
	[K6_U04] can plan and conduct experiments, critically analyze their results, draw conclusions and formulate opinions. Has laboratory experience.	The student is able to prepare, perform, and interpret an experiment using modern methods of imaging biological materials.			[SU5] Assessment of ability to present the results of task [SU3] Assessment of ability to use knowledge gained from the subject		
	[K6_U02] can analyze and solve simple scientific and technical problems based on possessed knowledge, applying analytical, numerical, simulation and experimental methods.	The student is able to prepare organic samples for imaging using selected microscopic methods.			[SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject		
Subject contents	Course content – laboratory <ul style="list-style-type: none"> Preparation and imaging of selected biological samples using optical microscopy Preparation and imaging of selected biological samples using electron microscopy Preparation and imaging of selected biological samples using atomic force microscopy 						
Prerequisites and co-requisites	knowledge of basic physics and chemistry						
Assessment methods and criteria	Subject passing criteria	Passing threshold			Percentage of the final grade		
	presentation of laboratory results	50.0%			100.0%		
Recommended reading	Basic literature	<ul style="list-style-type: none"> Weilie Zhou Zhong Lin Wang "Scanning Microscopy for Nanotechnology Techniques and Applications" V. L.Mironov "Fundamentals of Scanning Probe Microscopy" 					
	Supplementary literature	Nanosurf easyScan 2 - operating instruction					
	eResources addresses						

Example issues/ example questions/ tasks being completed	<ul style="list-style-type: none">• Prepare for imaging and perform blood sample imaging.• Prepare for imaging and perform bacterial imaging.• Prepare for imaging and perform mold spore imaging.
Practical activities within the subject	Not applicable

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