

表 GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Surface Science, PG_00020923								
Field of study	Nanotechnology								
Date of commencement of studies	October 2020		Academic year of realisation of subject			2022/2023			
Education level	first-cycle studies		Subject group			Obligatory subject group in the field of study			
						research in the field of study			
Mode of study	Full-time studies		Mode of delivery			at the university			
Year of study	3		Language of instruction			Polish			
Semester of study	5		ECTS credits			2.0			
Learning profile	general academic profile		Assessment form			assessment			
Conducting unit	Department of Solid State Physics -> Faculty of Applied Physics and Mathematics								
Name and surname	Subject supervisor	dr hab. inż. Jacek Ryl							
of lecturer (lecturers)	Teachers		dr hab. inż. Jacek Ryl						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project		Seminar	SUM	
	Number of study hours	15.0	0.0	0.0	0.0		15.0	30	
	E-learning hours included: 0.0								
Learning activity and number of study hours	Learning activity Participation ir classes include plan		I didactic Participation in ed in study consultation hours		Self-study SUM				
	Number of study hours	30		1.0		19.0		50	
Subject objectives	The goal of the subject is the presentation of basic problems resulting from he existence of interface between material objects and its surroundings. Discussion of the consequences arising from the existence of surface energy. Analysis of possible applications of surface phenomena in technology. Understanding of problems and benefits resulting from decreasing dimensions of objects with the special emphasis on the semiconductor band structure modification resulting from the surface charge distribution.								
Learning outcomes	Course outcome		Subject outcome			Method of verification			
	K6_W07		The student realises the problems and benefits of the progressive miniaturization of components and devices, with particular emphasis on the impact of surface phenomena			[SW1] Assessment of factual knowledge			
	K6_U01		The student knows how to use databases in order to perform a literature study concerning the broadly understood surface science.			[SU1] Assessment of task fulfilment			
	K6_K05		Is capable of analysing a scientific publication in English and on its basis prepare an oral presentation in Polish.			[SK3] Assessment of ability to organize work [SK4] Assessment of communication skills, including language correctness			
	K6_U02		The student is able to analyse the mutual influence of various phenomena relevant for the surface science.			[SU2] Assessment of ability to analyse information			
	K6_W03		The student has systematic knowledge of all fields of general physics.			[SW1] Assessment of factual knowledge			

Subject contents	troduction - ideal and real surface.								
	Surface crystallography.								
	Surface relaxation and reconstruction.								
	Surface tension and surface thermodynamics.								
	Chemical and physical adsorption a	physical adsorption and its influence on surface properties.							
	Physics of semiconductor surface.								
	Surface effects in technology (flotation, detergention, etc.).								
	Friction - dry friction theories, boundary friction.								
	Natural and artificial coatings								
	Colloids.								
	Selected technologies of thin layers	deposition.							
Prerequisites									
And co-requisites	Cubicat pagaing oritoria	Dessing threshold	Dereentage of the final grade						
and criteria	Multimedia assisted oral	50.0%	50.0%						
	presentation								
	Written work	50.0%	50.0%						
Recommended reading	Basic literature								
	K. W. Kolasinski: Surface Science - Foundations of Catalysis an Nanoscience								
	Supplementary literature	G. Bracco, B. Hols: Surface Science Techniques							
	eResources addresses	Adresy na platformie eNauczanie:							
Example issues/	Definition of surface energy and surface tension.								
tasks being completed									
	Discussion of the surface influence on semiconductor band structure.								
	Surface effects in technology.								
	Adsorption process description.								
	Analysis of reasons of the correction offset in stars								
	Analysis of reasons of the segregation effect in alloys.								
Work placement	Not applicable								