



Subject card

Subject name and code	Physics of condensed matter, PG_00057506						
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			exam		
Conducting unit	Zakład ceramiki -> Instytut Nanotechnologii i Inżynierii Materiałowej -> Faculty of Applied Physics and Mathematics						
Name and surname of lecturer (lecturers)	Subject supervisor	prof. dr hab. inż. Maria Gazda					
	Teachers	dr inż. Tadeusz Miruszewski prof. dr hab. inż. Maria Gazda					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	15.0	0.0	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	3.0		52.0	100	
Subject objectives	Learning the basics of the physics of the condensed phase						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	K7_K03						
	K7_W02						
	K7_W01						
Subject contents	1. Introduction. Review and elaboration of basics, reciprocal lattice, vibrations of atoms.2. Free electron gas.3. Electrons in a periodic potential.4. Near-free electron approximation. Strongly bound electron approximation.5. Energy bands, effective mass, the concept of a hole. Filling the bands - classification of solids.6. Semiconductors.7. Phenomena of transport.8. Contact phenomena.9. Superconductivity.10. Dielectric and optical properties.						
Prerequisites and co-requisites	no						
Assessment methods and criteria	Subject passing criteria	Passing threshold			Percentage of the final grade		
	exercise classes assesment	50.0%			35.0%		
	written exam	50.0%			65.0%		
Recommended reading	Basic literature	Solid State Physics, Kittel Semiconductor Physics, KireevIntroduction to solid state theory, Zimann					
	Supplementary literature	any					

	eResources addresses	Podstawowe https://enauczanie.pg.edu.pl/moodle/course/view.php?id=15182 - Fizyka Fazy Skondensowanej Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	Debye model of specific heatassumptions of the almost free electron modelTemperature dependence of the chemical potential of an n-type semiconductorBoltzmann kinetic equationtemperature dependence of electron mobility in a metal / semiconductore.t.c	
Work placement	Not applicable	