GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Physics of condensed matter, PG_00057506		
Field of study	Nanotechnology		
Date of commencement of studies	February 2023	Academic year of realisation of subject	2022/2023
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	prof. dr hab. inż. Maria Gazda dr inż. Tadeusz Miruszewski	

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_W02	Has in-depth, theoretically founded, detailed knowledge in the field of condensed phase physics	[SW1] Assessment of factual knowledge
K7_K03	Can interact and work in a group, assuming various roles in it. Can make a self-assessment and constructive assessment of the effects of other people's work	[SK1] Assessment of group work skills
K7_W01	Has an extended and structured knowledge in the field of materials science.	[SW1] Assessment of factual knowledge

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

<table>
<tr><td>Assessment methods and criteria</td><td colspan="3"><table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>written exam</td><td>50.0%</td><td>65.0%</td></tr>
<tr><td>exercise classes assesment</td><td>50.0%</td><td>35.0%</td></tr>
</table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td colspan="2">Solid State Physics, Kittel Semiconductor Physics, KireevIntroduction to solid state theory, Zimann</td></tr>
<tr><td>Supplementary literature</td><td colspan="2">any</td></tr>
<tr><td>eResources addresses</td><td colspan="2">Podstawowe
https://enauczanie.pg.edu.pl/moodle/course/view.php?id=15182 - Fizyka Fazy Skondensowanej
Adresy na platformie eNauczanie:</td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="3">Debye model of specific heatassumptions of the almost free electron modelTemperature dependence of the chemical potential of an n-type semiconductorBoltzmann kinetic equationstemperature dependence of electron mobility in a metal / semiconductore.t.c</td></tr>
<tr><td>Work placement</td><td colspan="3">Not applicable</td></tr>
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