GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Superconductivity and superconducting compounds, PG_00053757		
Field of study	Nanotechnology		
Date of commencement of studies	October 2022	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	2	Language of instruction	English
Semester of study	4	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 of lecturer (lecturers)	Subject supervisor	dr inż. Michał Winiarski	
	Teachers	dr inż. Michał Winiarski	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	30.0	0.0	0.0	0.0	0.0	30

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	30	0.0	0.0	30

Subject objectives

The aim of the course is to acquaint students with the basic issues of superconductivity. In particular, with materials showing the phenomenon of superconductivity.

Learning outcomes

Course outcome	Subject outcome	Method of verification
K7_W02	Student knows the possibilities for application of superconductors in nanotechnology.	[SW1] Assessment of factual knowledge
K7_K04	Student can plan learning and preparation for the exam within the semester time	[SK2] Assessment of progress of work

Subject contents

Historical introduction

Metallic state - band structure. Differences between metallic and superconducting state

Measurements of superconducting state properties

Selected families of superconducting materials

Practical applications of superconductors

Superconducting nanodevices

Prerequisites and co-requisites

Basic knowedge of synthesis methods in solid state chemistry. basic knoledge of crystallography.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
final test	51.0%	100.0%

Recommended reading

Basic literature	A.C. Rose-Innes, E.H. Rhoderick: *Introduction to Superconductivity*. Pergamon, 2015

	Supplementary literature	Ch. Kittel "Introduction to solid state physics" 8th ed., Wiley, 2005
	eResources addresses	Podstawowe http://hyperphysics.phy-astr.gsu.edu/hbase/Solids/scdis.html#c1 - Superconductivity in the HyperPhysics textbook Adresy na platformie eNauczanie: Superconductivity and Superconducting Materials - 23/24 - Moodle ID: 37953 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=37953
Example issues/ example questions/ tasks being completed	What is the superconducting critical temperature for YBa2Cu3O7.	
Work placement	Not applicable	