GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	, PG_00058707		
Field of study	Materials Engineering, Materials Engineering, Materials Engineering		
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 none
Semester of study	1	ECTS credits	5.0
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	dr inż. Tadeusz Miruszewski	
	Teachers	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	10.0	70.0	125

Subject objectives

Learning about the phenomena, technologies and applications of electroceramics.

Learning outcomes

Course outcome	Subject outcome	Method of verification
K7_W03	it is extended and deepened knowledge of electroceramics	[SW1] Assessment of factual knowledge
K7_U06	The student has knowledge of the design and testing of new ceramic materials.	[SU4] Assessment of ability to use methods and tools
K7_K01	Understands the need to update materials knowledge	[SK2] Assessment of progress of work

Subject contents

Preliminary news Technological issues of productionelectroceramics: Methods of producing ceramic powders; Ceramic densification methods (or vice versa, methodsproduction of porous ceramics); Methods of forming ceramic elements;Ion conductive electroceramics: Point defects, Kroger-Vink notation; Diffusion and ionic conductivity; Methods of testing electrical properties (e.g.impedance measurements); Doped ZrO2and other oxygen ion conductors; Proton conductors; Materials with mixed electron-ion conductivity; Applications of electroceramics: gas sensors,accumulators, batteries and cellsElectro-conductive electroceramics: Electron transport in ceramics; Test methods for electroceramics: Structural research; Electrochemical research; Examples of interesting materialselectroceramic: Perovskites and perovskite derivatives; Fluorite ceramics;

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Excercises	50.0%	40.0%
Lecture	50.0%	60.0%

Recommended reading

Basic literature	scientific publications

	Supplementary literature	jw
	eResources addresses	Podstawowe https://enauczanie.pg.edu.pl/moodle/course/view.php?id=30115 - e-Learning course.
Example issues/ example questions/ tasks being completed	defects in ionic crystalsdiffusion mechanismsKroger Vink notationSOFC	
Work placement	Not applicable	