

§ GDAŃSK UNIVERSITY § OF TECHNOLOGY

Subject card

Subject name and code	, PG_00058707							
Field of study	Materials Engineering, Materials Engineering							
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			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						ics and	
Name and surname	Subject supervisor	dr inż. Tadeusz Miruszewski						
of lecturer (lecturers)	Teachers		dr inż. Sebastian Wachowski dr inż. Tadeusz Miruszewski					
Lesson types and methods	Lesson type	Lecture	Tutorial	Laboratory	Projec	t	Seminar	SUM
of instruction	Number of study hours	30.0	15.0	0.0	0.0		0.0	45
	E-learning hours incl	uded: 0.0						
Learning activity and number of study hours	Learning activity Participation ir classes include plan		I didactic Participation in consultation hours		n Iours	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 S K7_K01 Understan materials k K7_U06 The studer design and materials.		Subject outcome			Method of verification		
			Understands the need to update materials knowledge			[SK2] Assessment of progress of work		
			The student h design and tem materials.	t has knowledge of the testing of new ceramic		[SU4] Assessment of ability to use methods and tools		
	K7_W03		it is extended and deepened knowledge of electroceramics		[SW1] Assessment of factual knowledge			
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;							
and co-requisites								

Assessment methods	Subject passing criteria	Passing threshold	Percentage of the final grade			
and criteria	Lecture	50.0%	60.0%			
	Excercises	50.0%	40.0%			
Recommended reading	Basic literature	scientific publications				
	Supplementary literature	jw				
	eResources addresses	Adresy na platformie eNauczanie:				
Example issues/ example questions/ tasks being completed	defects in ionic crystalsdiffusion mechanismsKroger Vink notationSOFC					
Work placement	Not applicable					