



Subject card

Subject name and code	Engineering ceramics, PG_00061926						
Field of study	Materials Engineering						
Date of commencement of studies	October 2023	Academic year of realisation of subject			2025/2026		
Education level	first-cycle studies	Subject group			Obligatory subject group in the field of study		
Mode of study	Full-time studies	Mode of delivery			at the university		
Year of study	3	Language of instruction			Polish		
Semester of study	6	ECTS credits			2.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Division of Ceramics -> Institute of Nanotechnology and Materials Engineering Engineering -> Faculty of Applied Physics and Mathematics -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Aleksandra Mielewczyk-Gryń					
	Teachers	dr hab. inż. Aleksandra Mielewczyk-Gryń					
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	0.0	15.0	0.0	30
	E-learning hours included: 0.0						
	eNauczenie source address: https://enauczenie.pg.edu.pl/2025/course/view.php?id=4190 Moodle ID: 4190 Ceramika inżynierska 2026 https://enauczenie.pg.edu.pl/2025/course/view.php?id=4190						
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	2.0	18.0	50		
Subject objectives	The aim of the course is to introduce students to the fundamentals of engineering ceramics, including their properties, classification, and applications. The course covers types of ceramics (oxide, non-oxide, and composite), methods of their synthesis and processing, and the influence of technological processes on material properties. It also presents practical applications of ceramics in industry, including electronics, medicine, energy, and aerospace.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K6_U07] Can obtain information from literature and other properly selected sources, also in English or other foreign language used for international communication in materials engineering.	The student acquires information on engineering ceramics from available sources, including English-language literature.	[SU2] Assessment of ability to analyse information [SU5] Assessment of ability to present the results of task [SU3] Assessment of ability to use knowledge gained from the subject
	[K6_U06] Can integrate obtained information, interpret it and draw conclusions, as well as formulate and justify opinions.	The student is able to prepare a summary of the properties and characteristics of selected engineering ceramics based on the analysis of available information.	[SU2] Assessment of ability to analyse information
	[K6_W07] Has detailed knowledge of selected problems of materials science.	The student is able to identify different types of engineering ceramics and discuss their properties and applications.	[SW1] Assessment of factual knowledge [SW2] Assessment of knowledge contained in presentation [SW3] Assessment of knowledge contained in written work and projects
	[K6_W03] Has knowledge of materials science and can relate the properties of materials with their structure and composition, knows the theoretical description of phenomena occurring in materials subjected to external factors.	The student is able to discuss the properties of engineering ceramics in a broad context, including their characteristics and applications.	[SW1] Assessment of factual knowledge [SW2] Assessment of knowledge contained in presentation [SW3] Assessment of knowledge contained in written work and projects
Subject contents	<p>Course content – lecture</p> <p>The course content covers the fundamental issues related to engineering ceramics, including their definition, classification, and physical and chemical properties. The main groups of ceramic materials are discussed, such as oxide, non-oxide, and composite ceramics, along with their characteristic features and areas of application.</p> <p>The course also presents methods of synthesizing engineering ceramics, including sintering, pressing, casting, and selected chemical techniques, with particular emphasis on the influence of technological parameters on the structure and properties of materials. Issues related to ceramic processing are also addressed, including mechanical and thermal methods as well as modern shaping and surface finishing techniques.</p> <p>Course content – project</p> <p>The project involves preparing, based on current scientific literature, a detailed description of the production process of a selected engineering ceramic material and planning its characterization. This includes the selection of appropriate raw materials, synthesis methods (e.g., sintering, pressing, or chemical techniques), and determination of key technological parameters affecting the materials structure and properties.</p> <p>Additionally, the project includes the selection of analytical methods to evaluate the physical, mechanical, and chemical properties of the produced material, as well as the analysis of results in the context of potential industrial applications.</p>		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	written test	50.0%	50.0%
	presentation+report	50.0%	50.0%
Recommended reading	Basic literature	Materials Science and Engineering AN INTRODUCTION WILLIAM D. CALLISTER, JR. DAVID G. RETHWISCH Wiley	
	Supplementary literature	2 Czasopismo Journal of the American Ceramic Society . American Ceramic Society,	
	eResources addresses		
Example issues/ example questions/ tasks being completed	<ul style="list-style-type: none"> List examples of engineering ceramics along with their applications Discuss the sol-gel synthesis method Discuss methods of powder milling 		
Practical activities within the subject	Not applicable		

Document generated electronically. Does not require a seal or signature.