



Subject card

Subject name and code	Glasses and amorphous materials, PG_00039754						
Field of study	Materials Engineering, Materials Engineering, Materials Engineering						
Date of commencement of studies	October 2021		Academic year of realisation of subject		2023/2024		
Education level	first-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	3		Language of instruction		Polish		
Semester of study	5		ECTS credits		2.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Zakład fizyki nanomateriałów -> Instytut Nanotechnologii i Inżynierii Materiałowej -> Faculty of Applied Physics and Mathematics						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Leszek Wicikowski				
	Teachers		dr inż. Leszek Wicikowski				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	0.0	0.0	15.0	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		1.0		19.0	50
Subject objectives	The main aim is to present the fundamental of the glassy state including structure, methods of preparation and application of glassy materials						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	K6_W07		The student uses theoretical knowledge about glasses and amorphous materials freely. Can define the methods of their production and research methods used to characterize these materials		[SW2] Assessment of knowledge contained in presentation		
	K6_U07		The student is able to prepare a seminar presentation based on the latest foreign-language scientific articles. Follows the latest achievements in materials engineering regarding amorphous materials		[SU5] Assessment of ability to present the results of task		
	K6_K01		Based on scientific papers, the student can prepare a written article on a given topic regarding nanostructural modifications of glasses and amorphous materials. The student can critically evaluate information. He can use the literature and knowledge of experts		[SK5] Assessment of ability to solve problems that arise in practice		
	K6_U09		The student prepares a seminar on a given topic using the latest scientific reports		[SU2] Assessment of ability to analyse information		
Subject contents	Glassy state of matter. Glass transition. Viscosity. Glass formation criteria. Random network. Radial distribution function. Glassforming oxides and modifiers. Structure of glass. Classification of inorganic oxide glasses. Crystallization processes and phase separation in glasses. Glass-ceramics Glass technology. Typical silicate, borate, phosphate and tellurite systems.						
Prerequisites and co-requisites	Fundamental knowledge in physics and chemistry						

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Seminar	50.0%	50.0%
	Colloquim	50.0%	50.0%
Recommended reading	Basic literature	R. H. Doremus Glass Science, Wiley 1973 J.E. Shelby, Introduction the glass science and technology, RSC 2005	
	Supplementary literature	Additional materials (electronic version) from lecturer	
	eResources addresses	Adresy na platformie eNauczanie: Szkła i Materiały Amorficzne - Moodle ID: 34629 https://enauczenie.pg.edu.pl/moodle/course/view.php?id=34629	
Example issues/ example questions/ tasks being completed	Glassy state of matter. Glass transition. Viscosity. Glass formation criteria. Random network. Radial distribution function. Glassforming oxides and modifiers. Structure of glass. Classification of inorganic oxide glasses. Crystallization processes and phase separation in glasses. Glass-ceramics Glass technology. Typical silicate, borate, phosphate and tellurite systems		
Work placement	Not applicable		