



## Subject card

Subject name and code	History of materials - history of civilization, PG_00060132						
Field of study	Civil Engineering, Environmental Engineering, Materials Engineering, Informatics, Mathematics, Transport, Management, Management, Materials Engineering, Informatics, Management, Economic Analytics, Economic Analytics, Space and Satellite Technologies, Automatic Control, Cybernetics and Robotics, Automatic Control, Cybernetics and Robotics, Green Technologies, Green Technologies, Coastal and Offshore Engineering, Mechanical and Medical Engineering, Mechatronics, Ocean Engineering, Mechanical Engineering, Materials Engineering, Space and Satellite Technologies, Coastal and Offshore Engineering, Ocean Engineering, Transport and Logistics, Ocean Engineering						
Date of commencement of studies	February 2022	Academic year of realisation of subject			2022/2023		
Education level	second-cycle studies	Subject group					
Mode of study	Full-time studies	Mode of delivery			e-learning		
Year of study	2	Language of instruction			Polish		
Semester of study	3	ECTS credits			2.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Department of Chemistry and Technology of Functional Materials -> Faculty of Chemistry						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Ewa Wagner-Wysiecka				
	Teachers		dr hab. inż. Ewa Wagner-Wysiecka				
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: 30.0						
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		2.0		18.0	50
Subject objectives	Materials of various nature, acquired or created in accordance with the technical and technological possibilities of the times, have influenced, influence and will influence our civilization (social relations, economy). The aim of the course is to show that engineering is not only exact sciences, and a broad interdisciplinary view of materials is the way to create new innovative technologies and solutions for the welfare of humanity.						
Learning outcomes	Course outcome		Subject outcome			Method of verification	
	[K7_K71] is able to explain the need to apply knowledge from humanistic, social, economic or legal sciences in order to function in a social environment		Student knows the historical and social background of the emergence/introduction of materials of a diverse nature. Student knows the areas of application of specific materials, also outside of technology.			[SK2] Assessment of progress of work	
	[K7_W71] has general knowledge in humanistic, social, economic or legal sciences, including their fundamentals and applications		Student is aware of the responsibility of the engineer's work for the social, economic and economic effects of his work and its potential impact on the development of civilization.			[SW1] Assessment of factual knowledge	
	[K7_U71] is able to apply knowledge from humanistic, social, economic or legal sciences in order to solve problems		Student knows the basic groups of materials used in different periods of civilization development and is able to place them in the chronology of its development.			[SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information	

Subject contents	<p>Materials - and their variety - used in specific historical periods: from prehistory, antiquity, through the Middle Ages and modernity to the present (e.g., clay, metals and their alloys, polymers and plastics, composites, semiconductor materials, smart materials, and others). The impact of advances in materials technology on social life, culture and the economy in particular historical periods - examples of breakthroughs and contributions to them. The impact of advances in the field of materials technology on the development of societies of different geographic locations and cultural affiliations. Environmental consequences (local and global) of technological development, with particular emphasis on selected materials technologies. Opportunities and threats of modern materials technologies.</p>								
Prerequisites and co-requisites									
Assessment methods and criteria	<table border="1"> <thead> <tr> <th data-bbox="456 555 786 584">Subject passing criteria</th> <th data-bbox="799 555 1139 584">Passing threshold</th> <th data-bbox="1152 555 1482 584">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="456 591 786 607">Written test</td> <td data-bbox="799 591 1139 607">51.0%</td> <td data-bbox="1152 591 1482 607">100.0%</td> </tr> </tbody> </table>	Subject passing criteria	Passing threshold	Percentage of the final grade	Written test	51.0%	100.0%		
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Written test	51.0%	100.0%							
Recommended reading	<p>Basic literature</p>	<p>S. J. Skrzypek, K. Przybyłowicz, Inżynieria metali i technologie materiałowe, Wydawnictwo Naukowe PWN, Warszawa 2019</p> <p>J. F. Biernat, Materiałoznawstwo, wyd.2. Wydawnictwo Politechniki Gdańskiej, Gdańsk, 2016.</p> <p>L. E. Murr, Handbook of Materials Structures, Properties, Processing and Performance, Springer International Publishing Switzerland, 2015</p> <p>J. F. Shackelford, Introduction to Materials Science for Engineers, wyd. 15., Pearson, 2015, USA</p> <p>Znaczenie materiałów inżynierskich w rozwoju cywilizacyjnym ludzkości, w: L.A. Dobrzański: Materiały inżynierskie i projektowanie materiałowe, Wydawnictwa Naukowo-Techniczne, Warszawa 2006, s. 59-97</p> <p>Metallurgy for the Non-Metallurgist, Ed. Arthur C. Reardon, 2nd Ed. ASM International, 2011</p>							
	<p>Supplementary literature</p>	<p>D. Catapoti, M. Relaki, Why the Neolithic is (r)evolutionary, 2020, 120, DOI: 10.1177/1359183519894012</p> <p>N. Spaldin, Fundamental Materials Research and the Course of Human Civilization, VSH-Bulletin, 2017, 2, 11-15</p> <p>Iron Age iron: from invention to innovation, w: Studies in Mediterranean Archaeology: Fifty Years On, ed. J. M. Webb, D. Frankel, Åströms Förlag, Uppsala 2012, 103-113</p> <p>M. G. Voronkov, Origin of the Silicon Era, Glass Physics and Chemistry, 2009, 35(3), 231236</p> <p>T. Ohmi, M. Hirayama, A. Teramoto, New era of silicon technologies due to radical reaction based semiconductor manufacturing, Journal of Physics D: Applied Physics, 2005, 39, R1</p> <p>G. Collin, History of Carbon Materials w: Industrial Carbon and Graphite Materials: Raw Materials, Production and Applications, WILEY-VCH GmbH, 2021, 33-43</p>							

	eResources addresses	<p>Podstawowe</p> <p><a href="https://www.plasticseurope.org/pl/about-plastics/what-are-plastics/history">https://www.plasticseurope.org/pl/about-plastics/what-are-plastics/history</a> - Supplementary material</p> <p><a href="https://www.mrs.org/programs-outreach/education-and-public-outreach/impact-of-materials-on-society">https://www.mrs.org/programs-outreach/education-and-public-outreach/impact-of-materials-on-society</a> - Supplementary material</p> <p>Uzupełniająca</p> <p>Adresy na platformie eNauczenie:</p> <p>Historia materiałów - historia cywilizacji 2022/2023 - Moodle ID: 28585  <a href="https://enauczenie.pg.edu.pl/moodle/course/view.php?id=28585">https://enauczenie.pg.edu.pl/moodle/course/view.php?id=28585</a></p>
Example issues/ example questions/ tasks being completed	<p>1. Why do materials play an important role in society - what do you think the world would look like today if some of them were not there? Give examples. 2. Discuss the political and/or economic factors influencing the development of materials technology using a selected example (e.g., access to raw materials).3. What are the main differences between current functional ceramics and "early" ceramics?4. Recording and transmission of information: written materials vs. modern methods of data collection and processing. Success or threat?</p>	
Work placement	Not applicable	