GDAŃSK UNIVERSITY OF TECHNOLOGY

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, Medical and Mechanical 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

Historia materiałów - historia cywilizacji 2022/2023 - Moodle ID: 28585
https://enauczanie.pg.edu.pl/moodle/course/view.php?id=28585

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	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.	
Prerequisites and co-requisites		
Assessment methods and criteria		

Subject passing criteria	Passing threshold	Percentage of the final grade
Written test	51.0%	100.0%

Recommended reading	Basic literature	S. J. Skrzypek, K. Przybyłowicz, Inżynieria metali i technologie materiałowe, Wydawnictwo Naukowe PWN, Warszawa 2019 J. F. Biernat, Materiałoznawstwo, wyd.2. Wydawnictwo Politechniki Gdańskiej, Gdańsk, 2016. L. E. Murr, Handbook of Materials Structures, Properties, Processing and Performance, Springer International Publishing Switzerland, 2015 J. F. Shackelford, Introduction to Materials Science for Engineers, wyd. 15., Pearson, 2015, USA Znaczenie materiałów inżynierskich w rozwoju cywilizacyjnym ludzkości, w: L.A. Dobrzański: Materiały inżynierskie i projektowanie materiałowe, Wydawnictwa Naukowo-Techniczne, Warszawa 2006, s. 59-97 Metallurgy for the Non-Metallurgist, Ed. Arthur C. Reardon, 2nd Ed. ASM International, 2011
	Supplementary literature	D. Catapoti, M. Relaki, Why the Neolithic is (r)evolutionary, 2020, 120, DOI: 10.1177/1359183519894012 N. Spaldin, Fundamental Materials Research and the Course of Human Civilization, VSH-Bulletin, 2017, 2, 11-15 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 M. G. Voronkov, Origin of the Silicon Era, Glass Physics and Chemistry, 2009, 35(3), 231236 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 G. Collin, History of Carbon Materials w: Industrial Carbon and Graphite Materials: Raw Materials, Production and Applications, WILEY-VCH GmbH, 2021, 33-43

	eResources addresses	Podstawowe https://www.plasticseurope.org/pl/about-plastics/what-are-plastics/history - Supplementary material https://www.mrs.org/programs-outreach/education-and-public-outreach/impact-of-materials-on-society - Supplementary material Uzupełniające https://www.plasticseurope.org/pl/about-plastics/what-are-plastics/history - Supplementary material https://www.mrs.org/programs-outreach/education-and-public-outreach/impact-of-materials-on-society - Supplementary material
Example issues/ example questions/ tasks being completed	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?	
Work placement	Not applicable	