GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Computer Aided Design and Selection of Materials, PG_00055501		
Field of study	Mechanical 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	6	ECTS credits	4.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Zakład Materiałoznawstwa I Technologii Materiałowych -> Institute of Manufacturing and Materials Technology -> Faculty of Mechanical Engineering and Ship Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Krzysztof Krzysztofowicz	
	Teachers	dr inż. Krzysztof Krzysztofowicz dr hab. Agata Lisińska-Czekaj	

Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	15.0	15.0	0.0	60
	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	60	4.0	36.0	100

Subject objectives

Combining knowledge from basic subjects with their practical use in the design and selection process materials, taking into account the functions performed; required characteristics of the material needed for implementation product. Obtaining the ability to critically analyze (validate) the design and selection of materials and choose the best optimal solution under precisely defined conditions.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_W03] possesses and is able to practically apply the knowledge on the construction, properties and testing methods of construction materials	Knows materials properties and research methods	[SW3] Assessment of knowledge contained in written work and projects
[K6_U10] is able to formulate the principles of selecting a material for a construction, ensuring the correct operation of a device	Is able to formulate the rules of selection material	[SU1] Assessment of task fulfilment

Subject contents

Lecture General principles of material design. The role of material design in the engineering design of products and their production processes. Elements and phases of engineering design. Principles of material selection - basic properties of individual groups of materials. Functional, sociological, ecological and economic factors in selection of materials. Ecological aspects of choosing a material solution. Software for analysis and selection of materials using various criteria. Selection support systems and material databases. Selection examples.

Project

Examples of selection due to mechanical properties, thermal properties and corrosion resistance. Selection analysis from taking into account the external and internal shape of the material. Independent solving assigned design tasks. Lab

Practical knowledge of materials testing methods. Basics of using ANSYS Granta software

Prerequisites and co-requisites		
Assessment methods and criteria		

Subject passing criteria	Passing threshold	Percentage of the final grade
Laboratory	50.0%	30.0%
Project	50.0%	30.0%
Lecture -colloquium	50.0%	40.0%

Recommended reading	Basic literature	1. Ashby M.F., Shercliff H., Cebon D.: Inżynieria materiałowa, tom 1 i 2, wyd. Galaktyka 2011 2. Ashby M.F.: Dobór materiałów w projektowaniu inżynierskim. WNT. Warszawa 1998 3. Ashby M.F., Jones D.R.H. Materiały inżynierskie - Właściwości i zastosowania - tom 1. WNT, Warszawa 1996 4. Ashby M.F., Jones D.R.H. Materiały inżynierskie - Kształtowanie struktury i właściwości materiałów - tom 2. WNT, Warszawa 1998 5. Dobrzański L.A.: Materiały inżynierskie i projektowanie materiałowe: podstawy nauki o materiałach i metaloznawstwo. WNT. Warszawa 2006 6. Blicharski M. : Wstęp do inżynierii materiałowej. Wyd. II, WNT, Warszawa 1998
	Supplementary literature	1. Blicharski M.: Inżynieria materiałowa. Stal. WNT, Warszawa 2004. 2. Ciszewski B., Przetakiewicz W.: Nowoczesne materiały w technice. Wyd. Bellona, W-wa 1993. 3. Dobrzański L.A.: Podstawami nauki o materiałach i metaloznawstwo. WNT, Gliwice - Warszawa 2002. 4. Dobrzański L.A.: Metaloznawstwo z podstawami nauki o materiałach. WNT Warszawa 1996. 5. Dobrzański L.A.: Metalowe materiały inżynierskie. WNT Warszawa 2004.
	eResources addresses	Adresy na platformie eNauczanie: Komputerowe projektowanie i dobór materiałów, W, MiBM, sem.6, letni, 2023/24 - Moodle ID: 36870 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=36870 Komputerowe projektowanie i dobór materiałów, W, MiBM, sem.6, letni, 2023/24 - Moodle ID: 36870 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=36870 Komputerowe projektowanie i dobór materiałów, W, MiBM, sem.6, letni, 2023/24 - Moodle ID: 36870 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=36870
Example issues/ example questions/ tasks being completed	Comparison of material properties according to the indicated criteria Preparation of the design of the device, including the selection of material, assessment of its environmental friendliness and estimation of manufacturing costs What are the criteria for selecting materials What features of materials do we take into account in design?	
Work placement	Not applicable	