GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Fundamentals of thermokinetic, PG_00042194		
Field of study	Power Engineering, Power Engineering, Power Engineering, Power Engineering, Power Engineering		
Date of commencement of studies	October 2020	Academic year of realisation of subject	2022/2023
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	2.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Electrical Power Engineering -> Faculty of Electrical and Control Engineering		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Andrzej Augusiak	
	Teachers	dr inż. Alicja Lenarczyk dr inż. Wiktoria Stahl	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	15.0	0.0	0.0	0.0	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	3.0	17.0	50

Subject objectives

The purpose of this course is to familiarize students with the issues of heat exchange between the environments.

Learning outcomes

Course outcome	Subject outcome	Method of verification
K6_K02	The student is able to explain and apply in engineering practice formulas describing the phenomena of heat exchange between media, in particular in group work.	[SK5] Assessment of ability to solve problems that arise in practice
K6_W12	The student is able to characterize the basic phenomena of heat transfer depending on the type, as well as mathematical functions describing these phenomena.	[SW1] Assessment of factual knowledge

Subject contents

1. Basic physical definitions.
2. Basic laws of heat transfer. Fourier, Fourier-Kirchhoff, Newton, Peclet, Stefan-Boltzmann equation, Planck, Kirchhoff law.
3. Conduction, convection heat transfer, heat transfer by radiation in the stationary states.
4. Overall heat transfer.
5. Steady flow of heat in devices with internal heat source.
6. Heat exchangers.

Prerequisites and co-requisites

Good knowledge of elements of physics (basic lows, physical quantities and their units and measures, mechanics, electrical engineering, thermodynamics, heat transfer). Basic knowledge of mathematics: algebra, geometry, trigonometry, differential and integral calculus. Basic knowledge of technical drawing.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
colloquium (practice)	60.0%	40.0%
colloquium (lecture)	60.0%	60.0%

<table>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td>1. Pudlik W.: Wymiana i wymienniki ciepła. Wydawnictwo Politechniki Gdańskiej, Gdańsk 1988
2. Hering M.: Termokinetyka dla elektryków. WNT, Warszawa 1980
3. Szargut J.: Termodynamika. Państwowe Wydawnictwo Naukowe, Warszawa 1980
4. Hobler T.: Ruch ciepła i wymienniki ciepła. WNT Warszawa
5. Furmański P., Domański R.: Wymiana ciepła. Przykłady obliczeń i zadania. Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2004
6. Zbiór zadań z przepływu ciepła. Praca zbiorowa pod redakcją Edwarda Kostkowskiego. Wydawnictwo Politechniki Śląskiej, Gliwice 2006</td></tr>
<tr><td>Supplementary literature</td><td>1. Massalski J.M., Studnicki J.: Międzynarodowy układ jednostek miar SI. Państwowe Wydawnictwo Naukowe, Warszawa 1971
2. Staniszewski B.: Wymiana ciepła. Podstawy teoretyczne. Państwowe Wydawnictwo Naukowe, Warszawa 1998
3. Wiśniewski T., Wiśniewski S. - Wymiana ciepła. Wyd. 6. Państwowe Wydawnictwo Naukowe, Warszawa 2006</td></tr>
<tr><td>eResources addresses</td><td>Adresy na platformie eNauczanie:</td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="2">1. Describe a physical interpretation of the specific heat conductivity and heat transfer coefficient.
2. What is the configuration factor for radiation heat transfer?
3. Describe how to calculate the heat transfer resistance between a stand-alone factor in a closed container and atmospheric air (verbal and mathematical description).
4. What will be the impact of the amount of heat lost when the window is covered by the blind? (Explain the physical processes).
5. Insulation is applied to the external walls of the building. Why?</td></tr>
<tr><td>Work placement</td><td colspan="2">Not applicable</td></tr>
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