GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	, PG_00056115		
Field of study	Mechatronics		
Date of commencement of studies	October 2024	Academic year of realisation of subject	2026/2027
Education level	first-cycle studies	Subject group	
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	Institute of Energy -> Faculty of Mechanical Engineering and Ship Technology -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Rafał Andrzejczyk	
	Teachers		

Lesson types

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: 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	0.0	0.0	30

Subject objectives

To acquaint the student with heat transfer processes and the methods of determining the required heat transfer surface in exchangers and their different types

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_U05] is able to use properly chosen tools to compare design solutions of elements and mechatronics systems according to given application and economic criteria (e.g. power demand, speed, costs)	Understands examples from practical applications of heat transfer presented in lecture	[SU4] Assessment of ability to use methods and tools
[K6_W08] knows and understands design and production processes of elements and simple mechatronic devices	can determine the required heat transfer surface area	[SW3] Assessment of knowledge contained in written work and projects
[K6_U06] is able to identify and formulate specification of simple, practical engineering tasks, distinctive for mechatronics	knows the laws related to heat transfer, also for non-stationary topics	[SU3] Assessment of ability to use knowledge gained from the subject
[K6_W10] has knowledge about development trends in the field of engineering and technology sciences and scientific disciplines: Mechanical Engineering, Automation, Electronics, Electrical Engineering and Space Technologies, adequate for Mechatronics curse	knows the mechanisms of heat exchange in mechatronic systems	[SW1] Assessment of factual knowledge

<table>
<tr><td>Subject contents</td><td>Course content – lecture
1. Classification of heat exchangers. Applications of heat exchangers in engineering practice.

2. Mechanisms of heat transfer

3. Approximate methods for determining heat transfer in non-stationary systems 4.

4, Procedures for determining the heat transfer surface by means of the mean logarithmic temperature difference and epsilon-NTU method

5, Mini-channel heat exchangers

6. development of operating characteristics of exchangers

7. heat exchanger sizing optimizatio</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>Thermodynamics, fluid mechanics, engineering graphics</td></tr>
<tr><td>Assessment methods and criteria</td><td><table><tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr><tr><td>lecture - test</td><td>60.0%</td><td>100.0%</td></tr></table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td>1. Lecture notes</td></tr>
<tr><td>Supplementary literature</td><td>Every book from the area of heat exchangers.</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td></td></tr>
<tr><td>Practical activites within the subject</td><td>Not applicable</td></tr>
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