GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Thermodynamics II, PG_00039885		
Field of study	Mechanical Engineering, Mechanical Engineering		
Date of commencement of studies	October 2020	Academic year of realisation of subject	2021/2022
Education level	first-cycle studies	Subject group	Obligatory subject group in the field of study 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	2	Language of instruction	Polish
Semester of study	4	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Institute of Energy -> Faculty of Mechanical Engineering and Ship Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Jan Wajs	
	Teachers	dr inż. Marcin Jewartowski mgr inż. Stanisław Głuch mgr inż. Piotr Jasiukiewicz dr hab. inż. Michał Klugmann dr inż. Waldemar Targański dr hab. inż. Jan Wajs	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	0.0	15.0	0.0	0.0	30

E-learning hours included: 0.0

Adresy na platformie eNauczanie:

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	5.0	40.0	75

Subject objectives

Introduce the thermal engineering field to the students.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_W09] possesses basic knowledge within the range of thermodynamics and fluid mechanics, construction and operation of heat generating devices, process equipment, including renewable energy sources, cooling and air conditioning	Student describes heat transfer mechanisms, uses the theory of moist gases and explains operational principles of refrigeration devices.	[SW1] Assessment of factual knowledge
[K6_U06] is able to use mathematical and physical models for analysing the processes and phenomena occurring in mechanical devices within the range of material strength, thermodynamics and fluid mechanics	Student performs the measurements on an experimental setup, makes necessary calculations and presents the results in the form of tables and graphs. Student explains the principles of thermal-hydraulic processes and issues related to energy conversion in technical applications.	[SU1] Assessment of task fulfilment

<table>
<tr><td>Subject contents</td><td>LECTURE: Fundamentals of heat transfer. Gas mixtures and moist gases. Mollier diagram and the basic moist air processes. Fundamentals of refrigeration. Basics of compressor and sorption heat pumps. Elements of combustion thermodynamics. LABORATORIES: Determination of calorific value of gas fuels. Determination of moist air enthalpy or testing of the fan. Testing of the refrigerating unit. Energy balance of piston engine. Testing of the compressor.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>Knowledge from course of Applied thermodynamics I, physics and mathematics.</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>Laboratory reports</td><td>100.0%</td><td>20.0%</td></tr>
<tr><td>Written exam</td><td>56.0%</td><td>80.0%</td></tr>
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<tr><td>Recommended reading</td><td>
<table>
<tr><td>Basic literature</td><td>Cengel Y.A., Boles M.A.: Thermodynamics.An engineering approach (5th edition), Publisher: McGraw-Hill Science (https://www.academia.edu/38166311/Thermodynamics_an_engineering_approach_5th_edition)</td></tr>
<tr><td>Supplementary literature</td><td>No requirements</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
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<tr><td>Example issues/ example questions/ tasks being completed</td><td>1. Mechanisms of heat transfer
2. Operational principle of compressor heat pumps
3. Heating and humidification of air</td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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