GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Thermodynamics I, PG_00040048		
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	Part-time studies	Mode of delivery	at the university
Year of study	2	Language of instruction	Polish
Semester of study	3	ECTS credits	5.0
Learning profile	general academic profile	Assessment form	exam
Conducting unit	Department of Energy and Industrial Apparatus -> Faculty of Mechanical Engineering and Ship Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Marcin Jewartowski	
	Teachers	dr inż. Marcin Jewartowski mgr inż. Aleksandra Gołąbek dr hab. inż. Michał Klugmann dr inż. Paweł Dąbrowski	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	8.0	15.0	0.0	0.0	38

E-learning hours included: 0.0

Termodynamika I, W, MiBM niestacjonarne, sem.03, zimowy 21/22, (M:31914W0) - Moodle ID: 18463
https://enauczanie.pg.edu.pl/moodle/course/view.php?id=18463

Termodynamika I, L, MiBM niestacjonarne, sem.03, zimowy 21/22, (M:31914W0) - Moodle ID: 18582
https://enauczanie.pg.edu.pl/moodle/course/view.php?id=18582

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	38	10.0	77.0	125

Subject objectives

Students acquire basic knowledge of thermodynamics in terms of theory and practice

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	The student defines the basic concepts of thermodynamics, the first and second law of thermodynamics and the equations of state of gases. Student describes and analyzes thermodynamic gas processes and thermodynamic gas cycles as well as heat transfer mechanisms.	[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 calculates thermodynamic parameters, thermodynamic gas processes and cycles as well as basic heat transfer mechanisms. Student measures basic thermodynamic parameters and analyzes the obtained results.	[SU1] Assessment of task fulfilment

Subject contents

LECTURE: Basic concepts. The first law of thermodynamics for closed and open systems. Properties of perfect and semi-perfect gases. Ideal gas laws. Thermal and caloric equations of state. Thermodynamic processes of ideal gas. Thermodynamics gas cycles. The second law of thermodynamics. Entropy. Fundamentals of heat transfer. TUTORIALS: Heat. Work. 1st Law of Thermodynamics. State and functions of state of gases. Gas mixtures. Thermodynamic processes. Gas thermodynamic cycles. Fundamentals of heat transfer. LABORATORY: Measurements of thermodynamic parameters: temperature and pressure. Measurements of mass flow rate and enthalpy rate. Measurements of lower heating value of fuels.

Prerequisites and co-requisites

Knowledge from course of physics and mathematics.

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Written calculation test	56.0%	35.0%
	Reports and oral or written test from laboratories	56.0%	30.0%
	Written exam	56.0%	35.0%
Recommended reading	Basic literature	1. Pudlik W., Termodynamika. Wyd. PG, 1998. 2. Pudlik W. (red.), Termodynamika - zadania i przykłady obliczeniowe. Wyd. PG, 2000. 3. Pudlik W. (red.), Termodynamika - Laboratorium I miernictwa cieplnego. Wyd. PG, 1993. 4. Pudlik W. (red.), Termodynamika - Laboratorium II badania maszyn i urządzeń. Wyd. PG, 1991.	
	Supplementary literature	1. Wiśniewski S., Termodynamika techniczna. WNT, 2005	
	eResources addresses		
Example issues/ example questions/ tasks being completed	Present and describe ideal gas law. Describe basic mechanisms of heat transfer. Calculate efficiency of thermodynamic gas cycle.		
Work placement	Not applicable		