GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Therodynamics, PG_00060457						
Field of study	Mechanical and Naval Engineering						
Date of commencement of studies	October 2025		Academic year of realisation of subject		2026/2027		
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		6.0		
Learning profile	general academic profile		Assessment form		exam		
Conducting unit	Division Of Heating Ventilation Air Conditioning And Refrigeration -> Institute Of Energy -> Faculty Of Mechanical Engineering And Ship Technology -> Wydziały Politechniki Gdańskiej						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Marcin Jewartowski				
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	27.0	18.0	9.0	0.0	0.0	54
	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	54		10.0	86.0		150
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 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 and vapour 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 and vapour 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
[K6_W02] possesses an organized knowledge on physics, including classic mechanics, electricity and magnetism, shows knowledge of the elements of thermodynamics	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 and vapour processes and thermodynamic gas cycles as well as heat transfer mechanisms.	[SW1] Assessment of factual knowledge
[K6_U01] is able to acquire information from specialized literary sources, databases and other resources, essential for solving engineering tasks; is able to compile the obtained information pieces and to interpret them, additionally is able to form conclusions and present justified opinion	Student calculates thermodynamic parameters, thermodynamic gas and vapour processes and cycles as well as basic heat transfer mechanisms. Student measures basic thermodynamic parameters and analyzes the obtained results.	[SU2] Assessment of ability to analyse information

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. Vapour and vapour properties. Thermodynamic vapour processes. Rankine Cycle. Efficiency of steam power plant. Linde Cycle. Fundamentals of heat transfer. TUTORIALS: Pressure. Heat. Work. 1st Law of Thermodynamics. State and functions of state of gases. Gas mixtures. Thermodynamic processes. Thermodynamic gas cycles. Vapour properties. Vapour processes and cycles Fundamentals of heat transfer. LABORATORY: Measurements of thermodynamic parameters. Energy examinations of selected thermal machines.

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
Reports and oral or written test from laboratories	56.0%	30.0%
Written calculation test	56.0%	35.0%
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	Adresy na platformie eNauczanie:

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

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