

Subject card

Mode of study	Subject name and code	Thermodynamics I, PG_00055117								
Studies first-cycle studies first-cycle studies Subject group Obligatory subject group in the field of study Subject group related to science and the university Subject subject study Subject group related to science and the university Subject group related to science and the university Subject group related to science and the university Subject group related to science at the university Subject group related to science and the university Subject group related to science and the university Subject group related to science at the university Subject group related to science at the university Subject group related to science at the university Subject group related to science and the university of the university Subject group related to science and the university Subject group related to science and the university of the university Subject group related to science and the university of the university of the university Subject group and the unive	•	Mechanical Engineering								
Mode of study	Date of commencement of	October 2021					2022/2023			
Mode of study	Education level	first-cycle studies		Subject group		Subject group related to scientific				
Year of study 2	Mode of study	Part-time studies	Mode of delivery			,				
Semester of study	·			•			Polish			
Learning profile general academic profile Assessment form exam	•			<u> </u>			5.0			
Conducting unit Department of Energy and Industrial Apparatus Faculty of Mechanical Engineering and Ship Technol	•						exam	exam		
Name and surname of lecturer (lecturers) Subject supervisor Teachers Gr in2. Marcin Jewartowski mgr in2. Stanisław Głuch mgr in2. Kamil Stasiak dr hab. in2. Michał Klugmann dr in2. Paweł Dąbrowski Lesson types and methods of instruction Lesson type Lecture Number of study hours E-learning hours included: 0.0 Learning activity and number of study hours Number of study hours Subject objectives Students acquire basic knowledge of thermodynamics in terms of theory and practice Learning outcomes Course outcome [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 [K6_W09] possesses basic knowledge within the range of Testudent defines the basic concepts of thermodynamics, the knowledge within the range of Testudent defines the basic concepts of thermodynamics, the knowledge within the range of Subject othermodynamics, the knowledge within the range of Subject othermodynamics, the knowledge [K8_W08] possesses basic knowledge within the range of Testudent defines the basic concepts of thermodynamics, the knowledge [SW1] Assessment of factual knowledge [SW1] Assessment of factual knowledge	Ť.	Department of Energy				Engine	Engineering and Ship Technology			
Teachers Teachers dr in2. Marcin Jewartowski mgr in2. Stanisław Gluch mgr in2. Stanisław Gluch mgr in2. Michał Klugmann dr in2. Paweł Dąbrowski		-								
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Lesson types and methods of instruction Lesson type and methods of instruction Learning activity and number of study hours Learning activity and number of study hours E-learning activity and number of study hours Number of study hours E-learning activity classes included in study plan Number of study hours Students acquire basic knowledge of thermodynamics in terms of theory and practice Learning outcomes Course outcome Subject outcome Subject outcome Subject outcome Subject outcome Method of verification 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. [K6_W09] possesses basic knowledge within the range of material strength, thermodynamic parameters and analyzes the obtained results. The student defines the basic concepts of thermodynamics, the knowledge										
Lesson types and methods of instruction Lesson type Lecture Tutorial Laboratory Project Seminar SUM Number of study 15.0 8.0 15.0 0.0 0.0 0.0 38 E-learning hours included: 0.0 Learning activity Participation in didactic classes included in study plan Number of study hours Number of study Participation in didactic classes included in study plan Number of study hours Sulf-study SUM Number of study 38 10.0 77.0 125 Subject objectives Students acquire basic knowledge of thermodynamics in terms of theory and practice Learning outcomes Subject outcome Method of verification [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, thermodynamic parameters and analyzes the obtained results. [K6_W09] possesses basic knowledge within the range of factual knowledge in thermodynamics in the pasic concepts of thermodynamics, the knowledge in thermodynamics in the pasic concepts of thermodynamics, the knowledge in thermodynamics in the pasic concepts of thermodynamics, the knowledge in the production in didactic classes included in study plan in consultation hours in the pasic participation in consultation hours in the consultation hours in the participation in consultation in the participation in consultation hours in the participation in consultation in the participation in consultation in the										
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of instruction Number of study hours 15.0 8.0 15.0 0.0 0.0 38				dr inż. Paweł Dąbrowski						
Learning activity and number of study hours Learning activity Participation in didactic classes included in study plan	Lesson types and methods	Lesson type	Lecture	Tutorial	Laboratory	Projec	t	Seminar	SUM	
Learning activity and number of study hours		hours		8.0	15.0	0.0		0.0	38	
Classes included in study plan Consultation hours					i		i		-	
Subject objectives Students acquire basic knowledge of thermodynamics in terms of theory and practice	5	classes include				Self-study		SUM		
Course outcome Subject outcome Method of verification			38		10.0		77.0		125	
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mechanics, construction and operation of heat generating devices, process equipment, including renewable energy sources, cooling and air conditioning thermodynamic gas conditioning thermodynamics and the equations of state of gases. Student describes and analyzes thermodynamic gas processes and thermodynamic gas processes and thermodynamics and the equations of state of gases.		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			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					
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 function of state of gases. Gas mixtures. Thermodynamic processes. Gas thermodynamic cycles. Fundamentals 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.	ouzjost some	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 Nowledge from course of physics and mathematics. 10 04 2024 13:03 Strong 1 z 2	and co-requisites	Ů	se or priysics a	nu matnematio	.ə.					

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Assessment methods	Subject passing criteria	Passing threshold	Percentage of the final grade		
and criteria	Written exam	56.0%	35.0%		
	Reports and oral or written test from laboratories	56.0%	30.0%		
	Written calculation test	56.0%	35.0%		
Recommended reading	Basic literature	Pudlik W., Termodynamika. Wyd. PG, 1998. Pudlik W. (red.), Termodynamika - zadania i przykłady obliczeniowe. Wyd. PG, 2000. Pudlik W. (red.), Termodynamika - Laboratorium I miernictwa cieplnego. Wyd. PG, 1993. Pudlik W. (red.), Termodynamika - Laboratorium II badania maszyn i urządzeń. Wyd. PG, 1991.			
	Supplementary literature	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 thermodynamic gas cycle.	. Describe basic mechanisms of heat	transfer. Calculate efficiency of		
Work placement	Not applicable	·	·		

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