



Subject card

Subject name and code	Thermodynamics for Management and Production Engineering, PG_00039947						
Field of study	Management and Production Engineering, Management and Production 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	3	ECTS credits	3.0				
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	prof. dr hab. inż. Jan Staśiek					
	Teachers	prof. dr hab. inż. Jan Staśiek dr inż. Paweł Dąbrowski mgr inż. Piotr Jasiukiewicz dr inż. Marcin Jewartowski dr hab. inż. Michał Klugmann mgr inż. Aleksandra Gołąbek					
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: Termodynamika dla ZiIP, W, ZiIP, sem.03, zimowy 21/22, (M:31813W0) - Moodle ID: 18620 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=18620 Termodynamika dla ZiIP, W, ZiIP, sem.03, zimowy 21/22, (M:31813W0) - Moodle ID: 18620 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=18620						
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	Students acquire basic knowledge of thermodynamics in the dimension of theory and practice						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	K6_W04	student defines basic concepts of thermodynamic, 1st and 2nd Law of Thermodynamic and equations of state of gases. Student describes and analyses gas and steam thermodynamic processes and cycles and heat transport mechanisms. Student measures basic thermodynamic parameters and analysis energy balance of heat engines and devices.	[SW1] Assessment of factual knowledge
	K6_U02	Student defines basic concepts of thermodynamic, 1st and 2nd Law of Thermodynamic and equations of state of gases. Student describes and analyses gas and steam thermodynamic processes and cycles and heat transport mechanisms. Student measures basic thermodynamic parameters and analysis energy balance of heat engines and devices.	[SU1] Assessment of task fulfilment
Subject contents	LECTURE: Basic concepts. The first law of thermodynamics for closed and open systems. Properties of ideal, semi-ideal and real gases. Gas laws. Thermal and caloric equation of state. Thermodynamic processes of ideal gas. Thermodynamics gas cycles. The second law of thermodynamics. Entropy. Steam and steam cycles. LABORATORY: Measurements of thermodynamic parameters: temperature and pressure. Determination of mass flow rate and enthalpy. Energy balance of heat pump and combustion engine or compressor. Gas analysis.		
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
	exam	100.0%	100.0%
Recommended reading	Basic literature	1. Pudlik W.: Termodynamika. Wyd. PG, 1998. 2. Wiśniewski S.: Termodynamika techniczna. WNT, 2005 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. Mayhew R.: Engineering thermodynamics/Work & Heat Transfer. J. Wiley & Sons Inc. 1993. USA.	
	eResources addresses	Termodynamika dla ZiIP, W, ZiIP, sem.03, zimowy 21/22, (M: 31813W0) - Moodle ID: 18620 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=18620 Termodynamika dla ZiIP, W, ZiIP, sem.03, zimowy 21/22, (M: 31813W0) - Moodle ID: 18620 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=18620	
Example issues/ example questions/ tasks being completed	Present equations of first law of thermodynamics. Describe Carnot Cycle. Describe Rankine Cycle. Present definitions of second law of thermodynamics.		
Work placement	Not applicable		