

。 GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and adda	Thermodynamics, PG 00055287								
Subject name and code	Transport and Logistics								
Date of commencement of studies	October 2023		Academic year of realisation of subject			2024/2025			
Education level	first-cycle studies		Subject group						
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			6.0			
Learning profile	general academic profile		Assessment form		assessment				
Conducting unit	Institute of Ocean Engineering and Ship Technology -> Faculty of Mechanical Engineering and Ship Technology								
Name and surname	Subject supervisor		dr hab. inż. Damian Bocheński						
of lecturer (lecturers)	Teachers dr inż. Marcin Jewartowski								
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	oject Seminar		SUM	
	Number of study hours	30.0	15.0	15.0	0.0		0.0	60	
	E-learning hours included: 0.0								
Learning activity and number of study hours	Learning activity	Participation in classes includ plan	n didactic ed in study	Participation in consultation hours		Self-study		SUM	
	Number of study hours	60		10.0		80.0		150	
Subject objectives	acquaint with the basic concepts of classical thermodynamics, laws of thermodynamics, properties of thermodynamic substances, energy and exergy balances for thermodynamic systems, ideal cycles of thermal machines, and explain the importance of lecture subjects in engineering practice								
Learning outcomes	Course outcome		Subject outcome			Method of verification			
Subject contents	LECTURE Introduction. Fundamentals of thermodynamics. The zeroth law of thermodynamics. The principle of conservation of amount of substances. The first law of thermodynamics. Energy balance. Equations of ideal, semi-ideal and real states. Entropy. Changes in ideal gases. The second law of thermodynamics. Theoretical cycles in internal combustion piston engines. Theoretical cycles in internal combustion turbine engines. Thermodynamics of steams. Theoretical cycles in steam power plant. Theoretical cooling cycles and heat pumps.								
Prerequisites and co-requisites	Subject knowledge of Physics, Fluid Mechanics, Mathematics								
Assessment methods	Subject passing criteria		Passing threshold			Percentage of the final grade			
and criteria	colloquium on exercises		60.0%		25.0%				
	completion of laboratory exercises		100.0%		25.0%				
	colloquium from the lecture		60.0%			50.0%			
Recommended reading	Basic literature		Pudlik W.: Termodynamika. Wyd. PG, Gdańsk 1995. 2. Szargut J.: Termodynamika. PWN, Warszawa 1980. 3. Szargut J.: Termodynamika techniczna. PWN, Warszawa 1991. 4. Szargut J.: Termodynamika techniczna. PWN, Warszawa 1998. 5. Wiśniewski S.: Termodynamika techniczna. WNT, Warszawa 1980. 6. Wiśniewski S.: Termodynamika techniczna. WNT, Warszawa 1999. 7. Wiśniewski S., Wiśniewski T.S.:: Wymiana ciepła. WNT, Warszawa 1994. 8. Pudlik W., Grudziński D., Cieśliński J., Jasiński, W.: Termodynamika zadania i przykłady obliczeniowe. Gdańsk 2008						
	Supplementary literature		Buchowski H, Ufnalski W.: Podstawy termodynamiki, WNT, Warszawa 1998. 2. Domański R., Jaworowski M., Redow M., Kołdyś J.: Wybrane zagadnienia z termodynamiki w ujęciu komputerowym. PWN, Warszawa 2000. 3. Staniszewski B.: Termodynamika. PWN, Warszawa 1982.						
	eResources addresses		Adresy na platformie eNauczanie:						

Example issues/ example questions/ tasks being completed	1.Present the First Law of Thermodynamics in descriptive and analytical terms, 2. Describe the entropy of solids and liquids, 3. Draw a simple Joule cycle diagram and show graphs of such a cycle in "T-s" and "i-s" systems, and determine the formula for its efficiency, 4. Prove that the work performed by a piston machine in isothermal transformations is not equal for the same piston displacement, 5. Draw a heat graph for water, excluding heat of its pushing, and mark on it the heat
Work placement	Not applicable

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