



## Subject card

Subject name and code	Modern technologies in refrigeration, PG_00064935						
Field of study	Mechanical Engineering						
Date of commencement of studies	February 2025		Academic year of realisation of subject		2025/2026		
Education level	second-cycle studies		Subject group		Specialty subject group 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	1		Language of instruction		Polish		
Semester of study	2		ECTS credits		3.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Zaklad Ogrzewnictwa, Wentylacji, Klimatyzacji i Chłodnictwa -> Institute of Energy -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Waldemar Targański				
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	18.0	0.0	0.0	9.0	0.0	27
	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	27		5.0		43.0	75
Subject objectives	Deepening the knowledge of refrigeration technology, especially in the aspect of modern solutions						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K7_U12] dvelops her/his own potential and independently plans own, lifelong learning, while also being able to guide others in this regard		The student develops his or her potential and independently plans his or her own lifelong learning and is able to guide others in this area.		[SU4] Assessment of ability to use methods and tools		
	[K7_W01] explains and describes, on the basis of general knowledge of the scientific disciplines forming the theoretical basis of Mechanics and Mechanical Engineering, the structure and principles of operation of mechanical systems and processes		The student discusses the structure and principles of operation of appropriate systems and mechanical processes.		[SW1] Assessment of factual knowledge		
	[K7_U01] utilizes information obtained from the literature and other sources in the field of Mechanics and Mechanical Engineering and presents and analyses the results of solutions to technical problems in this field		The student appropriately uses the acquired information in the field of Mechanics and Mechanical Engineering and discusses solutions to technical problems in this area.		[SU3] Assessment of ability to use knowledge gained from the subject		

Subject contents	Current regulations and trends in the use of various refrigerants.		
	Carbon dioxide as a refrigerant.		
	Construction and principle of operation of refrigeration adsorption and absorption systems.		
	Construction and principle of operation of refrigeration thermoelectric units.		
	Construction and principle of operation of refrigeration gas systems.		
	Heat recovery from refrigeration systems.		
	Modern elements and systems of refrigeration automation.		
	Modern designs of refrigeration compressors.		
	Modern constructions of refrigeration heat exchangers.		
Prerequisites and co-requisites	Refrigeration technology, heat transfer		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Colloquium	60.0%	100.0%
Recommended reading	Basic literature	1. Bonca Z.: Chłodnictwo okrętowe. Wyd. Akademii Morskiej w Gdyni, 2006.  2. Bonca Z. i in.: Nowe czynniki chłodnicze i nośniki ciepła. Właściwości cieplne, chemiczne i eksploatacyjne. Poradnik. Wyd. MASTA, Gdańsk 2004.  3. Ullrich H.J.: Technika chłodnicza. Poradnik. Tom I, Wyd. MASTA, Gdańsk 1998.  4. Ullrich H.J.: Technika chłodnicza. Poradnik. Tom II. Wyd. MASTA, Gdańsk 1999.  5. Staniszewski D., Targański W.: Odzysk ciepła w instalacjach chłodniczych i klimatyzacyjnych. IPPU MASTA. Gdańsk 2007.  Papers in journals.	
	Supplementary literature	Papers in journals.	
	eResources addresses	Adresy na platformie eNauczanie:	
	Example issues/ example questions/ tasks being completed	Current regulations and trends in the use of various refrigerants.  Carbon dioxide as a refrigerant.  Construction and principle of operation of refrigeration adsorption and absorption systems.  Construction and principle of operation of refrigeration thermoelectric units.  Construction and principle of operation of refrigeration gas systems.  Heat recovery from refrigeration systems.	

Work placement	Not applicable
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