



Subject card

Subject name and code	Modern technologies in refrigeration, PG_00064840						
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	Full-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	Zakład 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	30.0	0.0	0.0	15.0	0.0	45
	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	45	5.0		25.0	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_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		
	[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_U12] develops 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		

Subject contents	<p>Current regulations and trends in the use of various refrigerants.</p> <p>Carbon dioxide as a refrigerant.</p> <p>Construction and principle of operation of refrigeration adsorption and absorption systems.</p> <p>Construction and principle of operation of refrigeration thermoelectric units.</p> <p>Construction and principle of operation of refrigeration gas systems.</p> <p>Heat recovery from refrigeration systems.</p> <p>Modern elements and systems of refrigeration automation.</p> <p>Modern designs of refrigeration compressors.</p> <p>Modern constructions of refrigeration heat exchangers.</p>								
Prerequisites and co-requisites	Refrigeration technology, heat transfer								
Assessment methods and criteria	<table border="1" data-bbox="448 860 1485 931"> <thead> <tr> <th data-bbox="448 860 798 898">Subject passing criteria</th> <th data-bbox="802 860 1142 898">Passing threshold</th> <th data-bbox="1147 860 1485 898">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="448 904 798 931">Colloquium</td> <td data-bbox="802 904 1142 931">60.0%</td> <td data-bbox="1147 904 1485 931">100.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	Colloquium	60.0%	100.0%
Subject passing criteria	Passing threshold	Percentage of the final grade							
Colloquium	60.0%	100.0%							
Recommended reading	<p>Basic literature</p> <p>Supplementary literature</p> <p>eResources addresses</p>	<p>1. Bonca Z.: Chłodnictwo okrętowe. Wyd. Akademii Morskiej w Gdyni, 2006.</p> <p>2. Bonca Z. i in.: Nowe czynniki chłodnicze i nośniki ciepła. Właściwości cieplne, chemiczne i eksploatacyjne. Poradnik. Wyd. MASTA, Gdańsk 2004.</p> <p>3. Ullrich H.J.: Technika chłodnicza. Poradnik. Tom I, Wyd. MASTA, Gdańsk 1998.</p> <p>4. Ullrich H.J.: Technika chłodnicza. Poradnik. Tom II. Wyd. MASTA, Gdańsk 1999.</p> <p>5. Staniszewski D., Targański W.: Odzysk ciepła w instalacjach chłodniczych i klimatyzacyjnych. IPPU MASTA. Gdańsk 2007.</p> <p>Papers in journals.</p> <p>Papers in journals.</p> <p>Adresy na platformie eNauczanie:</p>							
Example issues/ example questions/ tasks being completed	<p>Current regulations and trends in the use of various refrigerants.</p> <p>Carbon dioxide as a refrigerant.</p> <p>Construction and principle of operation of refrigeration adsorption and absorption systems.</p> <p>Construction and principle of operation of refrigeration thermoelectric units.</p> <p>Construction and principle of operation of refrigeration gas systems.</p> <p>Heat recovery from refrigeration systems.</p>								

Work placement	Not applicable
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