GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Modern technologies in refrigeration, PG_00064935		
Field of study	Mechanical Engineering		
Date of commencement of studies	February 2027	Academic year of realisation of subject	2027/2028
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	Division of Heating Ventilation Air Conditioning and Refrigeration -> Institute of Energy -> Faculty of Mechanical Engineering and Ship Technology -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Waldemar Targański	
	Teachers		

Lesson types

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

<table>
<tr><td>Subject contents</td><td>Course content – lecture
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.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>Refrigeration technology, heat transfer</td></tr>
<tr><td>Assessment methods and criteria</td><td><table><tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr><tr><td>Colloqium</td><td>60.0%</td><td>100.0%</td></tr></table></td></tr>
<tr><td>Recommended reading</td><td><table><tr><td>Basic literature</td><td>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.</td></tr><tr><td>Supplementary literature</td><td>Papers in journals.</td></tr><tr><td>eResources addresses</td><td></td></tr></table></td></tr>
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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.
Practical activites within the subject	Not applicable

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