COURSE DESCRIPTION CARD - SYLLABUS

Course name
Basics of refrigeration

Course

Field of study
Transport

Year/Semester
3/6

Area of study (specialization)

Profile of study
general academic

Level of study
First-cycle studies

Course offered in
Polish

Form of study
full-time

Requirements
elective

Number of hours

Lecture	Laboratory classes	Other (e.g. online)
30	15	0
Tutorials	Projects/seminars	
15	0	

Number of credit points

3

Lecturers

Responsible for the course/lecturer:
dr hab. inż. Krzysztof Bieńczak prof.PP

Faculty of Civil and Transport Engineering

Responsible for the course/lecturer:

Prerequisites

Knowledge: The student has a general knowledge of the impact of technical objects and technologies on the environment.

Skills: The student is able to define the categories of threats to the environment that constitute a specific technological process implemented in the area of production and operation of food machinery and cooling devices and is able to indicate ways to counteract these threats.

Social competences: Working in an interdisciplinary team. Ability to lead a team and expand team knowledge.

Course objective

To acquaint students with the theoretical and practical problems related to the construction and operation of refrigeration facilities.

Course-related learning outcomes

Knowledge

The student has an extended and deepened knowledge of mathematics useful for formulating and solving complex technical tasks concerning various means of transport

The student has ordered and theoretically founded general knowledge in the field of key issues of technology and detailed knowledge in the field of selected issues in this discipline of transport engineering

Skills

The student is able to obtain information from various sources, including literature and databases (both in Polish and in English), integrate it properly, interpret it and critically evaluate it, draw conclusions, and comprehensively justify his/her opinion.

The student can properly use information and communication techniques, applicable at various stages of the implementation of transport projects

Social competences

The student is aware of the importance of knowledge in solving engineering problems, knows examples and understands the causes of malfunctioning transport systems that have led to serious financial and social losses or to serious loss of health and even life.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

The knowledge acquired during the lecture is verified on the basis of a written exam in the form of a test. The skills acquired during the classes are verified on the basis of a final test in the form of a written test and obligatory individual reports on laboratory classes.

Programme content

Division and principle of operation of refrigeration equipment. Linde cycles (wet and dry). Circuit with subcooling. Circuit with regeneration. Parameters characterizing single-stage refrigeration equipment. Multistage cycles. Losses in compressor refrigeration equipment, refrigerants. Coolant. Lubricating oils. Breakdown of compressors. Construction of reciprocating, screw and scroll compressors. Capacity control. Lubrication. Types of dangers and compressor safety devices. Factors affecting compressor performance. Condensers (classification, construction, operation). Evaporators (classification, construction, operation). regulators (classification, principle of operation, construction, operation).

Teaching methods

Information and problematic lecture with a multimedia presentation. Exercises - solving problems, laboratory (experiment) method.

Bibliography

Basic

1. Czapp M., Charun H., Bohdal T. Wielostopniowe urządzenia chłodnicze WSI Koszalin 1994

2. Bonca Z. Automatyka chłodnicza i klimatyzacyjna. Wyd. WSM Gdynia 1995

3. Postolski J., Gruda Z. Zamrażanie żywności. PWN 2001

Additional

1. B. Gaziński, Chłodnictwo dla praktyków, Systherm Serwis, Poznań 2013

Breakdown of average student's workload

	Hours	ECTS
Total workload	85	3,0
Classes requiring direct contact with the teacher	60	2,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) [1]	25	1,0

[1] delete or add other activities as appropriate