GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Boilers and Heat Exchangers, PG_00045072
Field of study	Ocean Engineering, Ocean Engineering

Date of commencement of studies	October 2020	Academic year of realisation of subject	2022/2023
Education level	first-cycle studies	Subject group	
Mode of study	Full-time studies	Mode of delivery	at the university
Year of study	3	Language of instruction	Polish
Semester of study	5	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	assessment

Conducting unit	Faculty of Ocean Engineering and Ship Technology

Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Roman Liberacki
	Teachers	dr inż. Roman Liberacki mgr inż. Dominik Kreft

Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	15.0	15.0	0.0	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	4.0	31.0	80

Subject objectives	Familiarize students with the basic processes and laws of heat flow and give them knowledge about the construction and operation of boilers and heat exchangers.

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K6_W05] has an organized knowledge on design, construction and operation of ocean technology objects and systems	The student has knowledge of the construction and operation of boilers and heat exchangers.	[SW1] Assessment of factual knowledge
	[K6_W06] has an organized knowledge on engineering methods and design tools allowing the conducting of projects within the construction and operation of ocean technology objects and systems	The student knows methods of designing of heat exchangers.	[SW1] Assessment of factual knowledge
	[K6_U05] can formulate a simple engineering task and its specification within the range of design, construction and operation of ocean technology objects and systems	The student is able to perform basic calculations in order to select a heat exchanger.	[SU1] Assessment of task fulfilment

Subject contents	Heat conduction. Heat transfer (free convection, forced convection, during vapor condensation. Overall heat transfer coefficient. Types of flow in heat exchangers. Construction of heat exchangers. Selection of heat exchangers. Steam heating system. Boilers, structure and characteristic values. Boilers, fuels for boilers and water in boilers. Boiler materials and boiler damage. Heat transfer in boilers.
Prerequisites and co-requisites	Knowledge from thermodynamics.

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Task completed assessment	100.0%	50.0%
	Final colloquium	50.0%	50.0%

Recommended reading	Basic literature	Balcerski A.: Siłownie okrętowe. Skrypt PG 1990
		Górski Z., Perepeczko A.: Okrętowe kotły parowe. Skrypt WSM Gdynia 2002
		Górski Z., Perepeczko A.: Okrętowe maszyny i urządzenia pomocnicze. Wyd. TRADEMAR 1998
	Supplementary literature	Pudlik W.: Wymiana i wymienniki ciepła. Skrypt PG 1980
		Szargut J.: Termodynamika. WN PWN. Warszawa 2000
	eResources addresses	Adresy na platformie eNauczanie: Kotły i wymienniki ciepła, W, C, sem.5, zimowy 22/23 (PG_00045072) - Moodle ID: 25240 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=25240 Kotły i wymienniki ciepła, W, C, sem.5, zimowy 22/23 (PG_00045072) - Moodle ID: 25240 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=25240
Example issues/ example questions/ tasks being completed	1. List and briefly describe heat transfer mechanisms. 2. Write and explain the Peclet equation 3. Explain the difference between fire tube and water tube boilers. 4. Determine the heat transfer coefficient of the tested heat exchanger.	
Work placement	Not applicable	