GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Operational Materials on Ships, PG_00045077		
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	Optional 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	3	Language of instruction	Polish
Semester of study	5	ECTS credits	4.0
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. Konrad Marszałkowski	
	Teachers		

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	30.0	15.0	15.0	0.0	0.0	60

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	60	7.5	32.5	100

Subject objectives

The aim of the course is to familiarize students with issues related to the origin of liquid and gaseous fuels and lubricants. Students learn about the properties and characteristics of propellants and lubricants used in the shipbuilding industry together with the methods of their determination. The course content also includes the classification and characteristics of fuels and lubricating oils from the point of view of operation.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[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 the dependencies determining the efficiency of the device and the energy system and their impact on fuel consumption.	[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 lists renewable and non-renewable energy sources. The student gives examples of marine propulsion systems, methods of generating electricity and heat on ships. The student knows the methods of fueling marine engines with petroleum fuels.	[SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject
[K6_W05] has an organized knowledge on design, construction and operation of ocean technology objects and systems	The student knows how to reduce fuel consumption by devices and energy systems. The student understands the impact of the efficiency of the energy system on the natural environment.	[SW1] Assessment of factual knowledge

Subject contents	1. Crude oil - definition, classification, preparation for transport.2. Distillation of crude oil, conservative distillation, destructive distillation, cracking.3. Properties of petroleum products.4. The task of the cooling system of marine piston engines, cooling agents (operational requirements).5. Installing the task lubricating oil.6. Lubricating oils, types, advantages and disadvantages, classification.7. Classification of marine fuels.8. Fuel installation cleaning of residual marine fuels.9. Plastic lubricants - advantages / disadvantages, types, classification.10. Fuels used in marine nuclear reactors, levels of enrichment, design of fuel elements.
Prerequisites and co-requisites	Not applicable.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
	60.0%	30.0%
	60.0%	60.0%
	100.0%	10.0%

Recommended reading

Basic literature	1.Urbański P.: Paliwa i smary, Wydawnictwo Politechniki Gdańskiej, Gdańsk 1997. 2.Urbański P.: Instalacje okrętów i obiektów oceanotechnicznych. Wydawnictwo Politechniki Gdańskiej, Gdańsk 1994. 3.Włodarski J.K.: Podstawy eksploatacji maszyn okrętowych. Tarcie i zużycie. Wydawnictwo Akademii Morskiej w Gdyni. Gdynia 2006.
Supplementary literature	4. Wojnowski W.: Okrętowe siłownie spalinowe. Morski Instytut Rybacki. Gdynia 1991. Część I, II.
eResources addresses	Adresy na platformie eNauczanie:

Example issues/ example questions/ tasks being completed	1. Crude oil - definition, classification, preparation for transport (diagram and short description of processes). 2. Distillation of crude oil, conservative distillation (diagram, short description of the process, fractions), decomposition distillation, cracking (input material, what we obtain, types of catalysts).3. Properties of petroleum products (viscosity, density, auto-ignition temperature, Conradson number, ash content, heating value UPPER / LOWER, cetane number, auto-ignition delay) and methods of their determination (briefly).4. The task of the cooling system of marine piston engines, cooling agents (operational requirements).5. Installing the task lubricating oil.6. Lubricating oils, types, advantages and disadvantages, classification (4 characteristic parameters, standard, designation).7. Classification of marine fuels.8. Fuel installation cleaning of residual marine fuels.9. Plastic lubricants - advantages / disadvantages, types (thickeners), classification.10. Fuels used in marine nuclear reactors, levels of enrichment, design of fuel elements.
Work placement	Not applicable