GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Fundamentals of the Ship Systems, PG_00060533		
Field of study	Naval Architecture and Offshore Structures		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2027/2028
Education level	first-cycle studies	Subject group	Obligatory subject group in the field of study 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	2	Language of instruction	Polish
Semester of study	3	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Division of Marine Power Plants -> Institute of Naval Architecture -> Faculty of Mechanical Engineering and Ship Technology -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	prof. dr hab. inż. Zbigniew Korczewski	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	30.0	0.0	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	5.0	25.0	75

Subject objectives

To teach the build, requirements and principles of exploiting the marine power plant and pipeline systems.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_W07] has knowledge of the principles of sustainable development	Student is able to determine the influence of technical solutions applied in ship power system (e.g. type of main propulsion) on environmental risks.	[SW1] Assessment of factual knowledge
[K6_U04] has skills that allow for self-education and preparation for work in an industrial environment, including the application of occupational health and safety rules	Student knows how to use public available as well as specialized and dedicated Internet resources and software when selecting criteria and comparative analysis of different types of ship systems. Applies general principles of proper use of equipment and systems during laboratory exercises on a computer simulator.	[SU3] Assessment of ability to use knowledge gained from the subject [SU1] Assessment of task fulfilment
[K6_W05] has an organized knowledge on design, construction and operation of ocean technology objects and systems	Student describes and explains the purpose of the solutions used in relation to typical ship system solutions. Explains the general construction of typical solutions structural ship installations on ships with internal combustion engines. Indicates the classification conditions affecting the structure of the installation.	[SW1] Assessment of factual knowledge

Subject contents

Course content – lecture
Lecture

The definition of the maritime system, function and classification of the maritime systems, formal and legal requirements in regards to the system and maritime equipment, the ship's movement ability - general information about the power transmission system, general information about the maritime systems, fire protection systems, bilge and ballast systems, sanitary systems of the ship, ventilation and conditioning, ship's refrigeration system and equipment. Dynamic positioning systems. Mooring and anchoring systems. Reliability of the ship's functioning. Ecological aspects of maritime systems' usage.

Laboratory

General construction, principle of operation, preparation for operation and use of selected ship systems - exercises on the simulator of ship systems and ship power system.

Prerequisites and co-requisites

Knowledge of the subiects: Technical mechanics, Construction and operating of machinery

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Midterm colloquium - lecture	51.0%	85.0%
Practical skills - laboratory	100.0%	15.0%

Recommended reading

Basic literature

1. Balcerski A.: Siłownie okrętowe. Podstawy termodynamiki, silniki i napędy główne, urządzenia pomocnicze, instalacje. Skrypt PG, Gdańsk 1990.
2. Giernalczyk M., Górski Z.: Siłownie okrętowe Część 2 Instalacje
3. okrętowe. Akademia Morska w Gdyni, Gdynia 2016
4. Urbański P.: Instalacje okrętów i obiektów oceanotechnicznych. Wyd. PG 1991
5. Wojnowski W.: Okrętowe siłownie spalinowe Wyd. PG 1999
6. Urbański P.: Instalacje spalinowych siłowni okrętowych. Skrypt PG, Gdańsk 1994

Supplementary literature

1. Więckiewicz W.: Instalacje kadłubowe statków morskich. WSM 1988
2. Szarejko J.: Technologia rurociągów okrętowych WM 1968
3. Przepisy klasyfikacji i budowy statków morskich.
4. Taylor D.A.: Introduction to Marine Engineering. Elsevier Butterworth-Heinemann, Oxford 2000

eResources addresses

Example issues/ example questions/ tasks being completed

1. The main energy systems of the ship - classification, functions.
2. General scheme of ballast system.
3. General propulsion efficiency vs. general energy efficiency - interpretation.
4. Construction and principle of operation of freshwater production equipment.
5. Methods of reducing NOx and SOx emissions.
6. Equipment redundancy in marine power systems.
7. Difference between ventilation and air conditioning.

Practical activites within the subject

Not applicable

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