GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Alternative Fuels and Propulsion, PG_00060571		
Field of study	Design and Construction of Yachts, Naval Architecture and Offshore Structures		
Date of commencement of studies	October 2025	Academic year of realisation of subject	2027/2028
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	6	ECTS credits	2.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Division Of Automation And Marine Energy -> Institute Of Naval Architecture -> Faculty Of Mechanical Engineering And Ship Technology -> Wydziały Politechniki Gdańskiej		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Jerzy Kowalski	
	Teachers		

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	30.0	0.0	0.0	0.0	0.0	30

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	30	3.0	17.0	50

Subject objectives

The aim of the course is to familiarize students with the methods of obtaining raw materials, including crude oil and natural gas from under the seabed as well as obtaining energy from renewable sources on the example of offshore wind farms.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_K03] is aware of the impact of non-technical aspects on the engineer's work and the impact of engineering activities on the natural environment	knows the principles of ergonomics and safety	[SK5] Assessment of ability to solve problems that arise in practice
[K6_W04] has knowledge in the field of computer science, electronics, electrical engineering, automation and control, information technology, computer graphics, useful for understanding the possibilities of their use in ocean engineering	has knowledge in the field of computer science, electronics, electrical engineering, automation and control, information technology, computer graphics, useful for understanding the possibilities of their application in ocean engineering	[SW1] Assessment of factual knowledge
[K6_U02] can work individually and in a team, communicate through various techniques in professional environment and also record, analyse, and present the results of work, can estimate the time needed to complete a given task	organizes group work	[SU1] Assessment of task fulfilment

Subject contents	The lecture material includes knowledge of: methods of searching for crude oil and natural gas under the seabed, installation and construction of individual elements of the oil field, basic offshore drilling methods, methods of laying submarine pipelines, the type of ocean engineering facilities for offshore works, including drilling and construction, machinery and equipment units for the construction and operation of the oil field (FSU / FSO, FPSU / FPSO, FPDSO, drilling and production platforms), offshore crude oil and natural gas reloading operations, offshore wind farm locations, installation and construction of wind farms, production of renewable energy, Polish and international regulations and institutions supervising the course of individual investment stages, starting from the conceptual design, ending with operation and distribution. The exercises and projects are aimed at making calculations and projects related to equipment and systems for oil and gas production and their installation (based on DNV, API, ISO regulations), including: fixed and detachable connections of elements the subsea structures, calculations, design and selection of pipelines for the transport of oil and gas, lowering of the structure from the deck of the ship/rig, on the seabed at a predetermined wave height. operations deposition components oil field on the seabed, calculation and selection the support structure for offshore wind farms.
Prerequisites and co-requisites	

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
exexercises and design - calculations and design of offshore devices and systems	60.0%	50.0%
lecture - tests (2 or 3)	60.0%	50.0%

Recommended reading	Basic literature	Saipem, "Offshore Pipelines". Bai Y., Bai Q.: Subsea Engineering Handbook. ELSEVIER Inc, New York, 2012. EEA, Europe's onshore and offshore wind energy potential, Technical report No 6/2009. Projekt UpWind Integrated Wind Turbine Design, Offshore Foundations and Support Structures. Polish Wind Energy Associacion, Assessment of the development opportunities and potential of wind energy in Poland until 2020. Ben C. Gerwick, Jr., Construction of marine and offshore structures, Taylor and Francis Group, San Francisco, 2007. Subrata K. Chakrabarti, Handbook of offshore engineering, Plainfield, Illinois, USA, 2005.
	Supplementary literature	Specialist magazines: Offshore, World Oil, Ocean Industry. Websites: www.offshore-technology.com/contractors/lifting/dreggen/. Karlic S.: Zarys górnictwa morskiego. Wydawnictwo Śląsk, 1984. Wiewióra A., Wesołek Z., Puchalski J., Ropa naftowa w transporcie morskim, Publisher Trademar, 2007.
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	

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