



## 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 2023		Academic year of realisation of subject		2025/2026		
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						
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
	exercises 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 Association, 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: <a href="http://www.offshore-technology.com/contractors/lifting/dreggen/">www.offshore-technology.com/contractors/lifting/dreggen/</a> .  Karlic S.: Zarys górnictwa morskiego. Wydawnictwo Śląsk, 1984.  Wiewióra A., Wesolek 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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