GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Technological challenges in the construction of offshore farms and vessels, PG_00070178		
Field of study	Naval Architecture and Offshore Structures		
Date of commencement of studies	February 2025	Academic year of realisation of subject	2025/2026
Education level	second-cycle studies	Subject group	
Mode of study	Full-time studies	Mode of delivery	at the university
Year of study	1	Language of instruction	English
Semester of study	2	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Division of Ecoengineering and Combustion Engines -> Institute of Energy -> Faculty of Mechanical Engineering and Ship Technology -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Jacek Kropiwnicki	
	Teachers	dr inż. Wojciech Kiełczyński, doc. PG dr hab. inż. Jacek Kropiwnicki	

Lesson types

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

eNauczanie source addresses:

Moodle ID: 2880 Technological challenges in the construction of offshore farms and vessels; OiKM; W, sem. 02, letni 25/26 (PG_00070178)
https://enauczanie.pg.edu.pl/2025/course/view.php?id=2880

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	0.0	0.0	30

Subject objectives

To familiarize students with selected material issues related to the technological aspects of the construction and operation of wind farms and drilling platforms. To present basic safety aspects related to the construction and operation of nuclear-powered ships.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_U82] is able to proficiently obtain and process information related to field of study and academic environment in foreign language at B2+ level of the Common European Framework of Reference for Languages (CEFR)	has the ability to efficiently acquire and process information in a foreign language regarding technological challenges in the construction of offshore farms and ships	[SU1] Assessment of task fulfilment
[K7_K82] is equipped to participate actively in lectures, seminars and laboratory classes conducted in foreign language	is prepared to actively participate in lectures, seminars, and laboratories conducted in a foreign language in the field of technological challenges in the construction of offshore farms and ships	[SK2] Assessment of progress of work
[K7_U14] integrates information obtained from literature and other properly selected sources, including those in a foreign language, creatively interpreting and critically evaluating them, and drawing conclusions	integrates information obtained from literature and other carefully selected sources regarding technological challenges in the construction of offshore farms and ships	[SU1] Assessment of task fulfilment
[K7_W12] identifies and interprets the main developmental trends and significant new achievements in the field of engineering and technical sciences and disciplines relevant to the course of study	identifies and interprets the main development trends and the most important new achievements in the field of technological challenges in the construction of offshore farms and ships	[SW2] Assessment of knowledge contained in presentation

<table>
<tr><td>Subject contents</td><td>Course content – lecture
a) Basic materials and technologies used in the construction of wind farm and drilling platform support structures 18 hours
- Structural steels and the requirements they face
- Selected aspects of joining methods and quality assurance systems
- Contemporary examples of implemented technologies for manufacturing wind farm components
- Case study failures, repair methods, and methods for preventing them in offshore structures
b) SMR (small modular reactor) as future equipment for nuclear-powered commercial vessels 12 hours
- SMR construction
- Safety as a fundamental imperative for SMR use
- Passive safety methods
- Outline of standards in the USA (ASME code III) and in Europe (ISO 9001 + 19 443)</td></tr>
<tr><td>Prerequisites and co-requisites</td><td></td></tr>
<tr><td>Assessment methods and criteria</td><td><table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Presentation</td><td>60.0%</td><td>50.0%</td></tr>
<tr><td>Test</td><td>60.0%</td><td>50.0%</td></tr>
</table></td></tr>
<tr><td>Recommended reading</td><td><table>
<tr><td>Basic literature</td><td>a) P.Biniek: Morska Energetyka Wiatrowa Wyd. Onepress 2023. Produkt cyfrowy e-book.

b) oprac. zbiorowe pod redakcją Ł Sikorskiego: Morska Energetyka Wiatrowa. Praktyczne wprowadzenie Wyd. Onepress 2023. Produkt cyfrowy

c) A. Zieliński: Elektrownie Jądrowe w nowoczesnej gospodarce Technologie, ekonomika, bezpieczeństwo. Wyd. PWN 2024.

d) J. Kubowski: Elektrownie Jądrowe Wyd. PWN 2017.</td></tr>
<tr><td>Supplementary literature</td><td>a) Offshore Wind Farms. Journal of Marine Sciences and Engineering. Wyd MDPI AG 2020.

b) Oprac. zbiorowe;Do we Need Nuclear Power in the UK. Wyd. Cranmore publication 2022.

c) Matt Fulchner: Nulear Power Plants. Wyd. Clanrye International 2014.</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
</table></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td>1. What types of steel are used for wind turbine towers and drilling platform structures? Material characteristics, mechanical properties, processability forming, welding, etc.
2. Steel processing methods for offshore structures, quality requirements.
3. Characteristics of SMR.
4. Basic safety principles for SMR operation.</td></tr>
<tr><td>Practical activites within the subject</td><td>Not applicable</td></tr>
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