GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

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|---|---|---|---|
| Subject name and code | , PG_00062019 | | |
| Field of study | Mechanical and Naval Engineering | | |
| Date of commencement of studies | October 2023 | Academic year of realisation of subject | 2025/2026 |
| Education level | first-cycle studies | Subject group | |
| Mode of study | Part-time studies | Mode of delivery | at the university |
| Year of study | 3 | Language of instruction | Polish |
| Semester of study | 6 | ECTS credits | 8.0 |
| Learning profile | general academic profile | Assessment form | assessment |
| Conducting unit | 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 | dr inż. Ryszard Pyszko | |
| | Teachers | | |

**Lesson types**

| Lesson type | Lecture | Tutorial | Laboratory | Project | Seminar | SUM |
|---|---|---|---|---|---|---|
| Number of study hours | 36.0 | 0.0 | 9.0 | 18.0 | 0.0 | 63 |

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 | 63 | 0.0 | 0.0 | 63 |

**Subject objectives**

The aim of the course is to familiarize students with the technological aspects of constructing large-scale offshore structures. It also aims to familiarize students with the problems of transporting, installing, and operating these structures, taking into account environmental, logistical, and legal conditions during the implementation of offshore and onshore investments.

**Learning outcomes**

| Course outcome | Subject outcome | Method of verification |
|---|---|---|
| [K6_U03] is able to identify, formulate and develop the documentation of a simple design or technological task, including the description of the results of this task in Polish or in a foreign language and to present the results using computer software or other aiding tools | The student is able to develop a project task related to the preparation and implementation of an offshore investment and present the results, taking into account environmental, legal, and economic aspects. | [SU3] Assessment of ability to use knowledge gained from the subject<br>[SU2] Assessment of ability to analyse information<br>[SU5] Assessment of ability to present the results of task |
| [K6_U14] is able to analyse the operation of devices and compare the construction solutions applying usage, safety, environmental, economic and legal criteria | The student is able to formulate criteria and conduct an analysis based on them, develop preliminary design solutions using safety, environmental, economic, and legal criteria. | [SU3] Assessment of ability to use knowledge gained from the subject<br>[SU4] Assessment of ability to use methods and tools<br>[SU5] Assessment of ability to present the results of task |
| [K6_W08] has a knowledge of the analysis and design of selected technical systems, machines and technical equipment, selection of construction materials, manufacturing and operation, including their life cycle | As part of a project task, the student is able to select construction, manufacturing, and operating materials throughout the life cycle of an offshore facility. | [SW2] Assessment of knowledge contained in presentation<br>[SW1] Assessment of factual knowledge |
| [K6_W11] has knowledge of analysis, design, technology and manufacturing of selected technical systems, machinery and equipment, metrology and quality control, knows and understands methods of measurement and calculation of basic quantities describing the operation of technical systems, knows basic calculation methods used to analyse experimental results | The student is able to apply knowledge of selected technical systems, machines, and devices to carry out assigned design tasks. The student is familiar with the basic calculation methods used to analyze experimental results. | [SW1] Assessment of factual knowledge<br>[SW3] Assessment of knowledge contained in written work and projects |

**Subject contents**

Course content – lecture

1. Introduction, classification of structures
2. Environmental conditions and structural loads, types of offshore structures
3. Structural materials, prefabrication and assembly, marine transport of structures
4. Offshore installation, foundations and foundations
5. Pipelines and subsea installations, offshore wind farms.
6. Operation and maintenance, safety and work organization.
7. Environmental protection and regulations, case studies, development trends

Course content – laboratory

The laboratory sessions build upon the topics covered in the lectures. During these sessions, students perform experiments on simplified models and sample flat sections.

1. Longitudinal planing determination of the coefficient of friction
2. Geodetic measurements of the spatial sections position (positioning relative to PP and PS)
3. Leveling of a flat section - (drawing, location, evaluation of shape and dimensions)
4. Preparation of a measurement sheet - for the specified section

Course content – project

The project concerns the selection of materials for the main structural elements of the hull in accordance with PRS regulations, based on simplified assumptions. The project applies criteria for minimum allowable material thicknesses and maximum thicknesses for NEGATIVE operating temperatures of the hull structure. As part of the project, a material take-off for the hull structure is being prepared.

**Prerequisites and co-requisites**

Basic knowledge of materials science, welding, machine construction, and surveying.

**Assessment methods and criteria**

| Subject passing criteria | Passing threshold | Percentage of the final grade |
|---|---|---|
| Lecture | 66.0% | 40.0% |
| Project | 100.0% | 30.0% |
| Lab | 100.0% | 30.0% |

**Recommended reading**

| | |
|---|---|
| Basic literature | Current classification society regulations regarding hull design and construction<br>Doerffer J.: Ship Hull Construction Technology, Wydawnictwo Morskie, Gdynia 1963.<br>Doerffer J.: Shipyard Production Organization, Wydawnictwo Morskie, Gdynia 1971<br>Doerffer J.: Ship Hull Repair Technology, Wydawnictwo Morskie,<br>Doerffer J.: Ship Outfitting Technology, Wydawnictwo Morskie, Gdynia 1975<br>Szarejko J.: Shipwrights Handbook, Wydawnictwo Morskie, Gdańsk 1977 |
| Supplementary literature | Websites and magazines |
| eResources addresses | |

**Example issues/ example questions/ tasks being completed**

List the types of steel used in the shipbuilding and maritime industries.
Describe the principles of ship hull assembly and wind turbine tower construction.
Explain what sandwich structures are in the shipbuilding industry.

**Practical activites within the subject**

Not applicable