GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

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|---|---|---|---|
| Subject name and code | Primary Energy Conversion in Modern Ship Propulsion, PG_00045080 | | |
| Field of study | Ocean Engineering, Ocean Engineering | | |
| Date of commencement of studies | October 2020 | Academic year of realisation of subject | 2022/2023 |
| Education level | first-cycle studies | Subject group | Optional subject group<br>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 | 5 | ECTS credits | 4.0 |
| Learning profile | general academic profile | Assessment form | assessment |
| Conducting unit | Faculty of Ocean 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 | 45.0 | 0.0 | 0.0 | 0.0 | 15.0 | 60 |

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 | 60 | 7.5 | 32.5 | 100 |

**Subject objectives**

Getting acquainted students with energetical evaluation of engines and power plants feeded with different primary energy form to transfer it to drive energy as well for transortation as for electricity generation plants. Attention is focused also on energetical effectiveness of renevable energey sources application.

**Learning outcomes**

| Course outcome | Subject outcome | Method of verification |
|---|---|---|
| [K6_W05] has an organized knowledge on design, construction and operation of ocean technology objects and systems | | |
| [K6_U05] can formulate a simple engineering task and its specification within the range of design, construction and operation of ocean technology objects and systems | | |
| [K6_W06] has an organized knowledge on engineering methods and design tools allowing the conducting of projects within the construction and operation of ocean technology objects and systems | | |
| | He can solve the problem of power systems efficiency | [SU2] Assessment of ability to analyse information<br>[SU4] Assessment of ability to use methods and tools<br>[SU5] Assessment of ability to present the results of task |
| | Can formulate assumtion for energy project | [SW1] Assessment of factual knowledge<br>[SW3] Assessment of knowledge contained in written work and projects |
| | can evaluate power system as en component of ocean economy | [SW1] Assessment of factual knowledge<br>[SW2] Assessment of knowledge contained in presentation |

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|---|---|---|
| Subject contents | Energy drive systems for power plants. Energy drive systems for marine power . Energy drive systems for power aviation. Hybrid drive systems. Introduction to power plant design methods. Introduction to graph therory. Application of fluid dynamics to design power systems. Design od efficient marine power plants. Applicatiion of artifficial intelligence systems in power plant design. | |
| Prerequisites and co-requisites | Basic knowledge in mechanics, thermodynamics and fluid dynamics | |
| Assessment methods and criteria | Subject passing criteria / Passing threshold / Percentage of the final grade | |
| | test from lectures — 60.0% — 50.0% | |
| | Seminary test — 80.0% — 50.0% | |
| Recommended reading | Basic literature | 1. Perycz S., ***Turbiny parowe i gazowe***, Skrypt PG, Gdańsk 1988.<br>2. Perycz S, ***Turbiny parowe i gazowe***, Ossolineum, Gdańsk 1989.<br>3. Traupel W., ***Thermische Turbomaschinen***, Spriger-Verlag<br>4. Szczeglaev A. W., ***Parovye turbiny***,<br>5. Urbański P., ***Gospodarka energetyczna na statkach***, Wyd. Morskie 1978<br>6. Kosowski K., ***Marine turbines***, Wyd. PG Two volumens<br>7. Cichy M.: ***Modelowanie systemów energetycznych,*** Gdańsk: Wyd. Politechniki Gdańskiej 2001.<br>8. Artemow G. A., Bojkow W. P., Gilmutdinow A. G., ***Sudowyje gazoturbinnyje ustanowki***, Sudostrojenie, Leningrad 1978.<br>9. Andrzejewski S., *Podstawy projektowania siłowni cieplnych*, WNT Warszawa 1975.<br>10. Ziembik A., *Gospodarka energetyczna*, Skrypt Politechniki Śląskiej, Gliwice 1992.<br>11. Dikij N. A., ***Sudowyje gazoparoturbinnyje ustanowki***, Sudostrojenie, Leningrad 1978.<br>12. **Technical literature esp. Transactions of ASME**. |
| | Supplementary literature | 1. Janiczek R. S., ***Eksploatacja elektrowni parowych***, WNT, Warszawa 1992.<br>2. Orłowski Z., ***Diagnostyka w życiu turbin parowych***, WNT, Warszawa 2001.<br>3. Szuman W., ***Urządzenia pomocnicze elektrowni parowych***, WNT, Warszawa 1962.<br>4. Bunin W. I., ***Eksploatacja turbin parowych***, WNT, Warszawa 1956.<br>5. Gundlach W. R., ***Maszyny przepływowe***, T.1-3, PWN, Warszawa 1971.<br>6. Łączkowski R., ***Drgania elementów turbin cieplnych***, WNT, Warszawa 1974.<br>7. Jakubik A., ***Uszkodzenia niemechaniczne urządzeń cieplnych elektrowni***, WNT, Warszawa 1974.<br>8. Gajewski T., Lesikiewicz A., Szymanik R., ***Przepływowe silniki odrzutowe***, WNT, Warszawa 1975.<br>9. Gajewski K., ***Turbinowe napędy samochodów***, WNT, Warszawa 1978. |
| | eResources addresses | Adresy na platformie eNauczanie: |
| Example issues/ example questions/ tasks being completed | Name criteria of energetical effectiveness of ship power plant presented to you | |
| Work placement | Not applicable | |