GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

| | | | |
|---|---|---|---|
| Subject name and code | Power Plant Consumables, PG_00033726 | | |
| Field of study | Power Engineering, Power Engineering, Power Engineering, Power Engineering, Power Engineering | | |
| Date of commencement of studies | October 2020 | Academic year of realisation of subject | 2021/2022 |
| Education level | first-cycle studies | Subject group | |
| Mode of study | Full-time studies | Mode of delivery | at the university |
| Year of study | 2 | Language of instruction | Polish |
| Semester of study | 3 | ECTS credits | 2.0 |
| Learning profile | general academic profile | Assessment form | assessment |
| Conducting unit | Department of Ship and Land Based Power Plants -> Faculty of Ocean Engineering and Ship Technology | | |
| Name and surname of lecturer (lecturers) | Subject supervisor | dr inż. Konrad Marszałkowski | |
| | Teachers | dr inż. Konrad Marszałkowski | |

**Lesson types and methods of instruction**

| Lesson type | Lecture | Tutorial | Laboratory | Project | Seminar | SUM |
|---|---|---|---|---|---|---|
| Number of study hours | 15.0 | 0.0 | 0.0 | 0.0 | 0.0 | 15 |

E-learning hours included: 0.0

Address on the e-learning platform: https://enauczanie.pg.edu.pl/moodle/course/view.php?id=7104
Adresy na platformie eNauczanie:
Materiały Eksploatacyjne Siłowni - Moodle ID: 17754
https://enauczanie.pg.edu.pl/moodle/course/view.php?id=17754

**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 | 15 | 2.0 | 33.0 | 50 |

**Subject objectives**

The aim of the course is to introduce students to issues related to the origin of liquid and gaseous fuels and lubricants. Students will learn the properties and characteristics of propellants and lubricants used in shipbuilding along with the methods of their determination. The content of the course also includes the classification and characteristics of fuels and lubricating oils from the operational perspective.

**Learning outcomes**

| Course outcome | Subject outcome | Method of verification |
|---|---|---|
| K6_K03 | The student understands the impact of petroleum-derived liquid fuels on the natural environment. The student understands the ecological values of using renewable energy sources. | [SK2] Assessment of progress of work |
| K6_W06 | Student is able to classify and characterize propellants and lubricants used in marine power plants. | [SW1] Assessment of factual knowledge |

**Subject contents**

1. Crude oil - definition, classification, preparation for transport2. Crude oil distillation - conservative distillation, destructive distillation, cracking3. Properties of petroleum products4. Task of the cooling system of marine piston engines, cooling agents (operational requirements);5. Lubricating oil installation - tasks;6. Lubricating oils - types, advantages and disadvantages, classification7. Classification of marine fuels8. Fuel installation - cleaning of residual marine fuels9. Plastic lubricants - advantages / disadvantages, types, classification10. Fuels used in marine nuclear reactors, levels of enrichment, design of fuel elements.

**Prerequisites and co-requisites**

<table>
<tr><td>Assessment methods and criteria</td><td colspan="2"><table><tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr><tr><td></td><td>60.0%</td><td>100.0%</td></tr></table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td>1.Urbański P.: Paliwa i smary, Wydawnictwo Politechniki Gdańskiej, Gdańsk 1997.<br><br>2.Urbański P.: Instalacje okrętów i obiektów oceanotechnicznych. Wydawnictwo Politechniki Gdańskiej, Gdańsk 1994.<br><br>3.Włodarski J.K.: Podstawy eksploatacji maszyn okrętowych. Tarcie i zużycie. Wydawnictwo Akademii Morskiej w Gdyni. Gdynia 2006.</td></tr>
<tr><td>Supplementary literature</td><td>4. Wojnowski W.: Okrętowe siłownie spalinowe. Morski Instytut Rybacki. Gdynia 1991. Część I, II.</td></tr>
<tr><td>eResources addresses</td><td>Materiały Eksploatacyjne Siłowni - Moodle ID: 17754<br>https://enauczanie.pg.edu.pl/moodle/course/view.php?id=17754</td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="2">1. Crude oil - definition, classification, preparation for transport (diagram and short description of processes); 2. Crude oil distillation - conservative distillation (diagram, short description of the process, fractions), decomposition distillation, cracking (input material, what we obtain, types of catalysts);3. Properties of petroleum products (viscosity, density, auto-ignition temperature, Conradson number, ash content, heating value TOP / LOWER, cetane number, auto-ignition delay) and methods of their determination (briefly);4. Task of the cooling system of marine piston engines, cooling agents (operational requirements);5. Lubricating oil installation - tasks;6. Lubricating oils - types, advantages and disadvantages, classification (4 characteristic parameters, standard, designation); 7. Classification of marine fuels;8. Fuel installation - cleaning of residual marine fuels;9. Plastic lubricants - advantages / disadvantages, types (thickeners), classification;10. Fuels used in marine nuclear reactors, levels of enrichment, design of fuel elements.</td></tr>
<tr><td>Work placement</td><td colspan="2">Not applicable</td></tr>
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