GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

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|---|---|---|---|
| Subject name and code | Renewable energy seminar II, PG_00037312 | | |
| Field of study | Technical Physics | | |
| 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 | 6 | ECTS credits | 1.0 |
| Learning profile | general academic profile | Assessment form | assessment |
| Conducting unit | Zakład Fotofizyki Molekularnej -> Instytut Fizyki i Informatyki Stosowanej -> Faculty of Applied Physics and Mathematics | | |
| Name and surname of lecturer (lecturers) | Subject supervisor | dr inż. Piotr Grygiel | |
| | Teachers | dr inż. Piotr Grygiel | |

**Lesson types and methods of instruction**

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

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 | 15 | 2.0 | 8.0 | 25 |

**Subject objectives**

Strengthening and systematizing the knowledge acquired during the lectures and learning its presentation by delivering a lecture on a given topic.

**Learning outcomes**

| Course outcome | Subject outcome | Method of verification |
|---|---|---|
| K6_K05 | [K6_K05] He can present the effects of his work, convey information in a generally comprehensible way, communicate, perform self-evaluation and constructive assessment of the effects of other people's work in the course of seminars. [SK4] Assessment of communication skills, including language correctness | [SK4] Assessment of communication skills, including language correctness |
| K6_U08 | Has the ability to prepare papers and written studies and oral presentations, in Polish and English, on issues related to renewable energy. | [SU5] Assessment of ability to present the results of task<br>[SU2] Assessment of ability to analyse information<br>[SU1] Assessment of task fulfilment |
| K6_U01 | Can learn independently, obtain information related to renewable energy, from literature, databases and other properly selected sources. | [SU5] Assessment of ability to present the results of task<br>[SU3] Assessment of ability to use knowledge gained from the subject<br>[SU2] Assessment of ability to analyse information<br>[SU1] Assessment of task fulfilment |
| K6_U07 | He can present the basic facts of physics and renewable energy in a popular way. | [SU5] Assessment of ability to present the results of task<br>[SU3] Assessment of ability to use knowledge gained from the subject<br>[SU1] Assessment of task fulfilment |

<table>
<tr><td>Subject contents</td><td>1. A farm of solar liquid collectors as a source of renewable energy.<br>2. Design of liquid collector systems.<br>3. Solar steam generating systems.<br>4. Cogeneration systems of fuel cells and analysis of the operation of the selected system.<br>5. Ways of obtaining geothermal energy and its use.<br>6. The use of biomass for the production of thermal energy.<br>7. Thermal energy storage systems.<br>8. Operation of a wind farm and its cooperation with the energy system.<br>9. Wind farms, their operational problems, impact on the energy system, its stability and energy quality.<br>10. Economic aspects of wind farm operation.<br>11. Design of wind generator systems.<br>12. The impact of wind farms on the environment.<br>13. Functions of hydropower plants in the power system.<br>14. Operating problems of a hydropower plant: cooperation of generators with the power grid, distributed production and energy accumulation.<br>15. The impact of hydropower plants on the environment.<br>16. Off-grid photovoltaic systems. "<br>17. On-grid" photovoltaic systems.<br>18. Designing photovoltaic installations.<br>19. Solar radiation concentrating systems.<br>20. PV/T hybrid systems.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>Basic lecture in physics in the field of mechanics, thermodynamics, electricity and magnetism, lecture on renewable energy sources as well as water-, wind energy and fuel cells.</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>Assessment of the oral presentation.</td><td>50.0%</td><td>100.0%</td></tr></table></td></tr>
<tr><td>Recommended reading</td><td><table><tr><td>Basic literature</td><td>1. J. F. Manwell, J. G Mc Gowan, A. L. Rogers, Wind Energy Explained. Theory, Design and Application. John Wiley & Sons, Ltd, 2009<br>2. A. Luque , S. Hegedus , Handbook of photovoltaic science and engineering, Wiley 2003.<br>3. S.A. Kalogirou, Solar Energy Engineering Processes and Systems, Elsevier Inc., 2014.<br>4. A.J. Dicks, A.L.Rand, Fuel Cell Systems Explained, 2018 John Wiley & Sons Ltd.</td></tr><tr><td>Supplementary literature</td><td>1. T. Burton, N. Jenkins, D. Sharpe, E. Bossanyi, Wind Energy Handbook, Willey & Sons Ltd., 2011<br>2. J. Nelson , The physics of solar cells , ICP, 2003.<br>3. K.M. Illyas, Fundamentals of Power Plant Engineering: Performance and Operation, LAP Lamberg Academic Publishing, 2018.</td></tr><tr><td>eResources addresses</td><td>Uzupełniające<br>Adresy na platformie eNauczanie:</td></tr></table></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td>As in the list of proposed topics.</td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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