University of Gdańsk

# Subject card

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|---|---|---|---|
| Subject name and code | Green energy technologies, PG_00179538 | | |
| Field of study | Chemistry, Environmental Protection | | |
| Date of commencement of studies | October 2026 | Academic year of realisation of subject | 2026/2027 |
| Education level | Master's studies | Subject group | Optional subject group |
| Mode of study | full-time studies | Mode of delivery | at the university |
| Year of study | 1 | Language of instruction | Polish |
| Semester of study | 2 | ECTS credits | 1.0 |
| Learning profile | academic | Assessment form | credit |
| Conducting unit | Faculty of Chemistry -> Rector | | |
| Name and surname of lecturer (lecturers) | Subject supervisor | dr inż. Aleksandra Pieczyńska | |
| | Teachers | | |

**Lesson types**

| 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

**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 | 5.0 | 10.0 | 30 |

**Subject objectives**

The aim of the course is to familiarize students with modern technologies for generating, storing and using energy in a sustainable and environmentally friendly way.

**Learning outcomes**

| Course outcome | Subject outcome | Method of verification |
|---|---|---|
| [OŚMU2_U01] On the basis of the acquired knowledge, proposes to solve environmental problems. | discusses the pros and cons of producing and using energy from renewable sources discusses the energy situation of the country and the world | [SU4] test/exam - oral or written |
| [OŚMU2_W05] Describes development directions and the latest discoveries in the field of scientific disciplines related to environmental protection. | discusses the energy situation of the country and the world lists and defines the basic types of renewable energy discusses the advantages and disadvantages of renewable energy production and use | [SW4] test/exam - oral or written |
| [OŚMU2_K01] Behaves in a professional manner at all times; bears full responsibility for the actions taken relating to the protection of the environment and respects the principles of professional ethics and principles of intellectual honesty. | in a comprehensible manner both orally and in writing presents correct technological reasoning, predicts, verifies and critiques the results of experiments carried out | [SK4] test/exam - oral or written |
| [OŚMU2_W04] Chooses methods, techniques and research tools used in environmental protection. | applies basic technological and chemical concepts describing the process of obtaining renewable energy discusses the advantages and disadvantages of producing and using energy from renewable sources | [SW4] test/exam - oral or written |

<table>
<tr><td>Subject contents</td><td colspan="3">Students will gain knowledge of renewable energy sources and innovative solutions to improve energy efficiency. Topics will include: renewable energy sources (RES) including solar energy (photovoltaics, solar panels), wind energy, hydropower (hydroelectric, tidal and wave power plants), solid biomass, liquid biomass and biogas (combustion and fermentation technologies), geothermal and energy storage technologies (batteries, hydrogen, heat storage)</td></tr>
<tr><td>Prerequisites and co-requisites</td><td colspan="3"></td></tr>
<tr><td>Assessment methods and criteria</td><td colspan="3"><table><tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr><tr><td>exam</td><td>51.0%</td><td>100.0%</td></tr></table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td colspan="2">1. Proekologiczne odnawialne źródła energii, W.M. Lewandowski, WNT 2012<br><br>2. Biopaliwa, W.M. Lewandowski, M. Ryms, WNT 2013</td></tr>
<tr><td>Supplementary literature</td><td colspan="2">Biopaliwa, technologie dla zrównoważonego rozwoju, E. Klimiuk, M. Pawłowska, T. Pokój, PWN 2012</td></tr>
<tr><td>eResources addresses</td><td colspan="2"></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="3">1 Describe the operation of dye-sensitized solar cells<br>2 List and describe methods of generating hydrogen from water<br>3 Describe the process of producing biofuel</td></tr>
<tr><td>Work placement</td><td colspan="3">Not applicable</td></tr>
</table>

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