



Subject card

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|---|---|--|----------|-------------------------------------|--|------------|-----|
| Subject name and code | Renewable energy seminar I, PG_00037311 | | | | | | |
| Field of study | Technical Physics | | | | | | |
| Date of commencement of studies | October 2022 | Academic year of realisation of subject | | | 2024/2025 | | |
| Education level | first-cycle studies | Subject group | | | Optional subject group 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 | | | 1.0 | | |
| Learning profile | general academic profile | Assessment form | | | assessment | | |
| Conducting unit | Institute of Physics and Applied Computer Science -> Faculty of Applied Physics and Mathematics | | | | | | |
| Name and surname of lecturer (lecturers) | Subject supervisor | dr inż. Daniel Pelczarski | | | | | |
| | Teachers | dr inż. Daniel Pelczarski | | | | | |
| 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 | To consolidate and systematize the knowledge acquired during lectures and learn how to present it by delivering a lecture on a given topic. | | | | | | |
| Learning outcomes | Course outcome | Subject outcome | | | Method of verification | | |
| | K6_U01 | Is able to independently obtain the source information on a selected topic of the lecture. | | | [SU1] Assessment of task fulfilment | | |
| | K6_U08 | Has the ability to prepare oral presentations on a selected topic. | | | [SU1] Assessment of task fulfilment | | |
| | K6_K05 | Can communicate a selected issue in a communicative way and assess the lectures of other people. | | | [SK4] Assessment of communication skills, including language correctness | | |
| | K6_U07 | He can present the basic facts of physics related to renewable energy in a popular way. | | | [SU1] Assessment of task fulfilment | | |

Subject contents

Presentation topics:

1. Energy generation methods. Directions of renewable energy development
2. Hydropower.
3. Wind energy. Wind farm design.
4. Photovoltaics - inorganic cells.
5. Photovoltaics - organic cells.
6. Photovoltaics - dye-sensitized solar cells.
7. Photovoltaics - perovskite cells.
8. Solar radiation angles and tracking systems.
9. Photovoltaics - multijunctions and radiation concentrators.
10. Practical aspects of photovoltaics.
11. Photovoltaic installations - modules, off-grid and on-grid systems . Elements of a PV installation.
12. Overview of the largest PV installations in Poland.
13. Prospects for the development of photovoltaics.
14. PV/T hybrid systems.
15. Solar collectors.
16. Biofuels - biomass and biogas.
17. Geothermal energy.
18. Heat pumps.
19. Renewable energy sources in building sector.
20. The concept of a self-sufficient building powered by renewable energy sources.
21. Energy storage - cells, batteries and accumulators.
22. Hydrogen energy - fuel cells.
23. New energy sources for transportation.
24. Environmental pollution related to renewable energy sources.

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| Prerequisites and co-requisites | Knowledge of mechanics, electricity and magnetism, quantum physics, and thermodynamics, within the scope of the basic academic course. | | |
| Assessment methods and criteria | Subject passing criteria | Passing threshold | Percentage of the final grade |
| | Assessment of the oral presentation: the content and the manner of its presentation. | 50.0% | 100.0% |
| Recommended reading | Basic literature | <p>1. S. C. Capareda, Introduction to Renewable Energy Conversions- CRC Press 2019.</p> <p>2. M.A.Hanif, F. Nadeem, R. Tariq, U. Rashid, Renewable and Alternative Energy Resources, Academic Press 2021.</p> <p>3. D. Ginley, D. Kahen, Fundamentals of materials for energy, Cambridge University Press 2011.</p> | |
| | Supplementary literature | <p>1. T.K. Ghosh, M.A. Prelas, Energy resources and systems, vol.2: Renewable Resources, Springer 2011.</p> <p>2. J-C. Sabonnadiere, Renewable Energies, Wiley 2009.</p> <p>3. J. Twidell, T. Weir, Renewable Energy Resources, Taylor & Francis 2005.</p> | |
| | eResources addresses | <p>Podstawowe https://enauczanie.pg.edu.pl/moodle/course/view.php?id=40311 - Addresses on the eLearning platform: Renewable Energy Seminar I 2024 Uzupełniające Adresy na platformie eNauczanie: Seminarium energetyki odnawialnej I - 2024 - Moodle ID: 40311 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=40311</p> | |
| Example issues/ example questions/ tasks being completed | See list of topics. | | |
| Work placement | Not applicable | | |

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