



Subject card

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|---|---|--|----------|-------------------------------------|--|---|-----|
| Subject name and code | Financial Planning and Economics of Wind Energy, PG_00066991 | | | | | | |
| Field of study | Smart Renewable Energy Engineering | | | | | | |
| Date of commencement of studies | October 2026 | Academic year of realisation of subject | | | | 2027/2028 | |
| Education level | second-cycle studies | Subject group | | | | Specialty 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 | 2 | Language of instruction | | | | English | |
| Semester of study | 3 | ECTS credits | | | | 2.0 | |
| Learning profile | general academic profile | Assessment form | | | | assessment | |
| Conducting unit | Department of Informatics In Management -> Faculty of Management and Economics -> Faculties of Gdańsk University of Technology | | | | | | |
| Name and surname of lecturer (lecturers) | Subject supervisor | dr Piotr Kasprzak | | | | | |
| | Teachers | | | | | | |
| Lesson types | Lesson type | Lecture | Tutorial | Laboratory | Project | Seminar | SUM |
| | Number of study hours | 0.0 | 30.0 | 0.0 | 0.0 | 0.0 | 30 |
| | 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 | 30 | | 4.0 | | 16.0 | 50 |
| Subject objectives | The aim of the course is to familiarize students with the processes related to the planning, implementation and management of wind energy systems, in an economic and environmental context, including strategic aspects that are key to the optimal use of wind energy as a renewable energy source. | | | | | | |
| Learning outcomes | Course outcome | Subject outcome | | | Method of verification | | |
| | [K7_K05] complies with legal regulations and standards related to renewable energy, including wind power, ensuring that energy installations and projects operate in accordance with current legislation | is able to apply knowledge of economic, legal and environmental issues in the planning and operation of wind energy systems | | | [SK5] Assessment of ability to solve problems that arise in practice | | |
| | [K7_U04] possesses remote diagnostic skills and the ability to address technical issues in energy systems using remote diagnostic tools | considers economic, legal and environmental issues in wind energy system designs | | | [SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information | | |
| | [K7_W05] understands the principles of sustainable development and safety in the context of energy systems, including the role of electrification, and can assess the environmental impact of renewable energy systems, particularly wind power installations | can explain the need to consider economic, legal and environmental issues in the planning and operation of wind energy systems | | | [SW1] Assessment of factual knowledge | | |
| | [K7_W06] is acquainted with global, European, and national energy policies and regulations regarding renewable energy and has basic knowledge of project management in the context of energy engineering | has knowledge of the economic and environmental aspects related to the planning and operation of wind energy systems | | | [SW1] Assessment of factual knowledge | | |

| Subject contents | <p>Course content – exercises</p> <ul style="list-style-type: none"> • <i>Investment costs:</i> <ul style="list-style-type: none"> • <i>Estimates of the costs of building a wind farm, the impact of various factors on costs (location, technology, farm size).</i> • <i>Operating costs:</i> <ul style="list-style-type: none"> • <i>Costs of operation and use of wind farms (service, repairs, insurance).</i> • <i>Revenue:</i> <ul style="list-style-type: none"> • <i>Electricity sales mechanism, tariffs, impact on the price of energy flowing to investors.</i> • <i>Financial analysis:</i> <ul style="list-style-type: none"> • <i>Calculations of financial indicators (NPV, IRR, payback period), assessment of investment profitability.</i> • <i>Investment risks:</i> <ul style="list-style-type: none"> • <i>Identification and assessment of various types of risks related to wind energy (technological, functional, specific risks).</i> • <i>Investment financing:</i> <ul style="list-style-type: none"> • <i>Sources of issuance (loans, bonds, own applications), financial instruments regarding investments in renewable energy.</i> • <i>Tax aspects:</i> <ul style="list-style-type: none"> • <i>Tax relief for investors in wind energy, the impact of legal regulations on profitability.</i> • <i>Integration with energy networks:</i> <ul style="list-style-type: none"> • <i>about energy production forecasting,</i> • <i>investments in energy transmission and storage networks,</i> • <i>cooperation with energy network operators.</i> • <i>Legal and social aspects:</i> <ul style="list-style-type: none"> • <i>environmental impact assessment,</i> • <i>to contribute to the community,</i> • <i>public consultations and educational activities for renewable energy.</i> | | | | | | | | | | | |
|--|--|--|--|--------------------------|-------------------|-------------------------------|---------|-------|-------|------|-------|-------|
| Prerequisites and co-requisites | Basic knowledge of energy systems in wind engineering | | | | | | | | | | | |
| Assessment methods and criteria | <table border="1" data-bbox="448 875 1498 976"> <thead> <tr> <th data-bbox="448 875 794 904">Subject passing criteria</th> <th data-bbox="794 875 1141 904">Passing threshold</th> <th data-bbox="1141 875 1498 904">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="448 904 794 934">Project</td> <td data-bbox="794 904 1141 934">60.0%</td> <td data-bbox="1141 904 1498 934">50.0%</td> </tr> <tr> <td data-bbox="448 934 794 976">Test</td> <td data-bbox="794 934 1141 976">60.0%</td> <td data-bbox="1141 934 1498 976">50.0%</td> </tr> </tbody> </table> | | | Subject passing criteria | Passing threshold | Percentage of the final grade | Project | 60.0% | 50.0% | Test | 60.0% | 50.0% |
| Subject passing criteria | Passing threshold | Percentage of the final grade | | | | | | | | | | |
| Project | 60.0% | 50.0% | | | | | | | | | | |
| Test | 60.0% | 50.0% | | | | | | | | | | |
| Recommended reading | Basic literature | <ul style="list-style-type: none"> • <i>Sadler, T. R. (2020). Energy economics: Science, policy, and economic applications. Rowman & Littlefield.</i> • <i>Anderson, C. (2020). Wind turbines: Theory and practice. Cambridge University Press.</i> • <i>Simon, C. A. (2024). Alternative energy: political, economic, and social feasibility. Rowman & Littlefield.</i> • <i>Yang, P. (2024). Renewable Energy: Challenges and Solutions. Springer Nature.</i> • <i>Cellik, S. (2023). Sustainable Energy: Engineering Fundamentals and Applications. Cambridge University Press.</i> | | | | | | | | | | |
| | Supplementary literature | <ul style="list-style-type: none"> • <i>Sathyajith, M. (2006). Wind energy: fundamentals, resource analysis and economics. Springer Science & Business Media.</i> • <i>Narbel, P. A., Hansen, J. P., & Lien, J. R. (2014). Energy technologies and economics. Springer.</i> • <i>Wizelius, T. (2015). Wind power projects: Theory and practice. Routledge.</i> • <i>Watson, S., Moro, A., Reis, V., Baniotopoulos, C., Barth, S., Bartoli, G., Wiser, R. (2019). Future emerging technologies in the wind power sector: A European perspective. Renewable and Sustainable Energy Reviews, 113, 109270. https://doi.org/10.1016/J.RSER.2019.109270</i> | | | | | | | | | | |
| | eResources addresses | | | | | | | | | | | |
| Example issues/ example questions/ tasks being completed | <ul style="list-style-type: none"> • <i>How is the cost of energy production (Levelized Cost of Energy, LCOE) calculated for wind projects?</i> • <i>What factors influence the profitability of investing in a wind farm?</i> • <i>Discuss the differences in investment costs for onshore and offshore projects.</i> • <i>List and discuss exemplary tax solutions supporting the construction of wind farms in Poland and around the world.</i> • <i>List the sources of renewable energy financing. Present their weak and strong sides.</i> • <i>Discuss the importance of Environmental Impact Assessments in the context of wind projects.</i> • <i>What strategies can be used to increase the share of wind energy in the global energy mix?</i> | | | | | | | | | | | |
| Practical activities within the subject | Not applicable | | | | | | | | | | | |

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