GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

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 2025	Academic year of realisation of subject	2026/2027
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 -> Wydziały Politechniki Gdańskiej		
Name and surname of lecturer (lecturers)	Subject supervisor	dr Piotr Kasprzak	
	Teachers		

Lesson types and methods of instruction

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_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
[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	[SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject
[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

Subject contents	• *Investment costs:*
	  • *Estimates of the costs of building a wind farm, the impact of various factors on costs (location, technology, farm size).*
	• *Operating costs:*
	  • *Costs of operation and use of wind farms (service, repairs, insurance).*
	• *Revenue:*
	  • *Electricity sales mechanism, tariffs, impact on the price of energy flowing to investors.*
	• *Financial analysis:*
	  • *Calculations of financial indicators (NPV, IRR, payback period), assessment of investment profitability.*
	• *Investment risks:*
	  • *Identification and assessment of various types of risks related to wind energy (technological, functional, specific risks).*
	• *Investment financing:*
	  • *Sources of issuance (loans, bonds, own applications), financial instruments regarding investments in renewable energy.*
	• *Tax aspects:*
	  • *Tax relief for investors in wind energy, the impact of legal regulations on profitability.*
	• *Integration with energy networks:*
	  • *about energy production forecasting,*
	  • *investments in energy transmission and storage networks,*
	  • *cooperation with energy network operators.*
	• *Legal and social aspects:*
	  • *environmental impact assessment,*
	  • *to contribute to the community,*
	  • *public consultations and educational activities for renewable energy.*

Prerequisites and co-requisites	*Basic knowledge of energy systems in wind engineering*

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Test	60.0%	50.0%
Project	60.0%	50.0%

Recommended reading

Basic literature	• *Sadler, T. R. (2020). Energy economics: Science, policy, and economic applications. Rowman & Littlefield.* • *Anderson, C. (2020). Wind turbines: Theory and practice. Cambridge University Press.* • *Simon, C. A. (2024). Alternative energy: political, economic, and social feasibility. Rowman & Littlefield.* • *Yang, P. (2024). Renewable Energy: Challenges and Solutions. Springer Nature.* • *Celik, S. (2023). Sustainable Energy: Engineering Fundamentals and Applications. Cambridge University Press.*
Supplementary literature	• *Sathyajith, M. (2006). Wind energy: fundamentals, resource analysis and economics. Springer Science & Business Media.* • *Narbel, P. A., Hansen, J. P., & Lien, J. R. (2014). Energy technologies and economics. Springer.* • *Wizelius, T. (2015). Wind power projects: Theory and practice. Routledge.* • *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*
eResources addresses	Supplementary https://windexchange.energy.gov - data, analytical tools and information on every stage of the energy development process

Example issues/ example questions/ tasks being completed	• *How is the cost of energy production (Levelized Cost of Energy, LCOE) calculated for wind projects?* • *What factors influence the profitability of investing in a wind farm?* • *Discuss the differences in investment costs for onshore and offshore projects.* • *List and discuss exemplary tax solutions supporting the construction of wind farms in Poland and around the world.* • *List the sources of renewable energy financing. Present their weak and strong sides.* • *Discuss the importance of Environmental Impact Assessments in the context of wind projects.* • *What strategies can be used to increase the share of wind energy in the global energy mix?*
Work placement	Not applicable

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