GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Renewable energy seminar I, PG_00037311		
Field of study	Technical Physics		
Date of commencement of studies	October 2023	Academic year of realisation of subject	2025/2026
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 -> Wydziały Politechniki Gdańskiej		
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

eNauczanie source address: https://enauczanie.pg.edu.pl/moodle/course/view.php?id=46626

Moodle ID: 46626 Seminarium energetyki odnawialnej I - semestr 2025/26 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=46626

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_U08] Can prepare written works and speeches in Polish and English, concerning detailed issues of physics and related fields, and scientific disciplines.	A student is able to prepare oral presentations on a chosen topic.	[SU1] Assessment of task fulfilment
[K6_K05] Can present own work results, transfer information in a commonly understandable manner, communicate and self-evaluate, as well as constructively evaluate the effects of other persons' work.	A student is able to present a selected issue in a clear and communicative way and to evaluate the presentations of others.	[SK4] Assessment of communication skills, including language correctness

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 sourcrs.

<table>
<tr><td>Prerequisites and co-requisites</td><td colspan="2">Knowledge of mechanics, electricity and magnetism, quantum physics, and thermodynamics, within the scope of the basic academic course.</td></tr>
<tr><td>Assessment methods and criteria</td><td colspan="2"><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: the content and the manner of its presentation.</td><td>50.0%</td><td>100.0%</td></tr>
</table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td>1. S. C. Capareda, Introduction to Renewable Energy Conversions-CRC Press 2019.

2. M.A.Hanif, F. Nadeem, R. Tariq, U. Rashid, Renewable and Alternative Energy Resources, Academic Press 2021.

3. D. Ginley, D. Kahen, Fundamentals of materials for energy, Cambridge University Press 2011.</td></tr>
<tr><td>Supplementary literature</td><td>1. T.K. Ghosh, M.A. Prelas, Energy resources and systems, vol.2: Renewable Resources, Springer 2011.

2. J-C. Sabonnadiere, Renewable Energies, Wiley 2009.

3. J. Twidell, T. Weir, Renewable Energy Resources, Taylor & Francis 2005.</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="2">See list of topics.</td></tr>
<tr><td>Work placement</td><td colspan="2">Not applicable</td></tr>
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