GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Environmental physics, PG_00037295		
Field of study	Technical Physics		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2027/2028
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	2	Language of instruction	Polish
Semester of study	3	ECTS credits	2.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Atomic Physics and Luminescence -> Faculty of Applied Physics and Mathematics -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. Mateusz Zawadzki	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	30.0	0.0	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	2.0	18.0	50

Subject objectives

Enviromental Physics course familiarizes students with the following topics:

Renewable Energy, Physics of Earth and Sun, Earth climate, acoustics and noise, enviroment studies etc.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_K01] demonstrates readiness for continuous learning and updating knowledge in physics and related fields, critically evaluating it and recognising its importance in solving practical and theoretical problems.	The student obtains knowledge on the subject of selected environmental measurements, understands environmental problems and is aware of the potential challenges, in present and future, related to the environment. The student understands the need to constantly expand his competences and knowledge in the subject of environmental physics in the rapidly changing conditions of the modern world.	[SK2] Assessment of progress of work
[K6_W02] possesses structured knowledge of the fundamentals of physics, including mechanics, thermodynamics, electricity and magnetism, optics, atomic and molecular physics, solid-state physics, and nuclear and particle physics.	The student has knowledge in the field of renewable energy physics and methods of their applications, climate physics, astronomy, the basics of acoustics, photovoltaic processes, seismology and other physical issues related to the environment in which he normally resides.	[SW1] Assessment of factual knowledge

Subject contents	Course content – lecture Energy, energy costs, renewable energy, scources of energy Temperature, heat, laser cooling Hydroenergy, wind energy, tides energy Energy of oceans, streams, marethermal energy, geothermal energy Sun, its structure, nuclear processes in the Sun, radiation energy, greenhouse effect Physics of Earth Nuclear energy Photovoltaics, basics, novel design of PV cells Earth energy budget (balance) Enviromental studies Noise Astronomy
Prerequisites and co-requisites	

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
	50.0%	100.0%

Recommended reading

Basic literature	Boeker E., van Grondelle R. Environmental Physics, Wiley, New York, 2011 Allen P.A. Earth Surface Processes, BlackWell Science Ltd, Hoboken, NJ, 1997 Stacey F.D., Physics of the Earth. Brookfield Press, Kenmore, Australia, 1992
Supplementary literature	Stacey F.D. Physics of the Earth, Brookfield Press, Kenmore, Australia, 1992 Sellers W.D. Physical Climatology, University of Chicago Press, Chicago, 1965 Hudson and Hudson, Laser Remote Sensing, Wiley-Interscience, New York, 1975
eResources addresses	

Example issues/ example questions/ tasks being completed	Structure of the Sun Black body, Stefan-Boltzman law, Wien law Energy of tides Radiative forcing Acoustics basics Spectroscopy Elastic scattering, Rayleigha law LIDAR
Practical activites within the subject	Not applicable

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