



## Subject card

Subject name and code	Environmental physics, PG_00037295						
Field of study	Technical Physics						
Date of commencement of studies	October 2023		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		blended-learning		
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	Katedra Fizyki Atomowej i Luminescencji -> Faculty Of Applied Physics And Mathematics -> Wydziały Politechniki Gdańskiej						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. Mateusz Zawadzki				
	Teachers		dr hab. Mateusz Zawadzki				
Lesson types and methods of instruction	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: 2.0						
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_W02] Has systematized knowledge of the basics of physics, including mechanics, thermodynamics, electricity and magnetism, optics, atomic and particle physics, solid-state physics, nuclear and elementary 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		
	[K6_K01] Understands the need to learn and improve professional and personal competencies. Can inspire and organize other people's learning process		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		

Subject contents	Energy, energy costs, renewable energy, sources 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)		
	Environmental 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	Adresy na platformie eNauczanie: Fizyka środowiska - Moodle ID: 42203 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=42203">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=42203</a>	

Example issues/ example questions/ tasks being completed	<p>Structure of the Sun</p> <p>Black body, Stefan-Boltzman law, Wien law</p> <p>Energy of tides</p> <p>Radiative forcing</p> <p>Acoustics basics</p> <p>Spectroscopy</p> <p>Elastic scattering, Rayleigha law</p> <p>LIDAR</p>
Work placement	Not applicable

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