



Subject card

Subject name and code	Environmental physics, PG_00037295						
Field of study	Technical Physics						
Date of commencement of studies	October 2024	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	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, Molecular and Optical Physics -> Faculty of Applied Physics and Mathematics						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. Mateusz Zawadzki				
	Teachers						
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: 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	Environmental Physics course familiarizes students with the following topics: Renewable Energy, Physics of Earth and Sun, Earth climate, acoustics and noise, environment 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, inspires and organizes 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	<p>Energy, energy costs, renewable energy, sources of energy</p> <p>Temperature, heat, laser cooling</p> <p>Hydroenergy, wind energy, tides energy</p> <p>Energy of oceans, streams, marethermal energy, geothermal energy</p> <p>Sun, its structure, nuclear processes in the Sun, radiation energy, greenhouse effect</p> <p>Physics of Earth</p> <p>Nuclear energy</p> <p>Photovoltaics, basics, novel design of PV cells</p> <p>Earth energy budget (balance)</p> <p>Enviromental studies</p> <p>Noise</p> <p>Astronomy</p>		
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	<p>Boeker E., van Grondelle R. Environmental Physics, Wiley, New York, 2011</p> <p>Allen P.A. Earth Surface Processes, BlackWell Science Ltd, Hoboken, NJ, 1997</p> <p>Stacey F.D., Physics of the Earth. Brookfield Press, Kenmore, Australia, 1992</p>	
	Supplementary literature	<p>Stacey F.D. Physics of the Earth, Brookfield Press, Kenmore, Australia, 1992</p> <p>Sellers W.D. Physical Climatology, University of Chicago Press, Chicago, 1965</p> <p>Hudson and Hudson, Laser Remote Sensing, Wiley-Interscience, New York, 1975</p>	
	eResources addresses	Adresy na platformie eNauczanie:	

<p>Example issues/ example questions/ tasks being completed</p>	<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, Rayleigh law</p> <p>LIDAR</p>
<p>Work placement</p>	<p>Not applicable</p>

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