

Subject card

Subject name and code	Green energy technologies, PG_00179538						
Field of study	Chemistry, Environmental Protection						
Date of commencement of studies	October 2025		Academic year of realisation of subject		2025/2026		
Education level	Master's studies		Subject group		Optional subject group		
Mode of study	full-time studies		Mode of delivery		at the university		
Year of study	1		Language of instruction		Polish		
Semester of study	2		ECTS credits		1.0		
Learning profile	academic		Assessment form		credit		
Conducting unit	Faculty of Chemistry -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Aleksandra Pieczyńska				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	0.0	0.0	0.0	15
	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	15		5.0		10.0	30
Subject objectives	The aim of the course is to familiarize students with modern technologies for generating, storing and using energy in a sustainable and environmentally friendly way.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[OŚMU2_W04] Chooses methods, techniques and research tools used in environmental protection.		applies basic technological and chemical concepts describing the process of obtaining renewable energy discusses the advantages and disadvantages of producing and using energy from renewable sources		[SW4] test/exam - oral or written		
	[OŚMU2_K01] Behaves in a professional manner at all times; bears full responsibility for the actions taken relating to the protection of the environment and respects the principles of professional ethics and principles of intellectual honesty.		in a comprehensible manner both orally and in writing presents correct technological reasoning, predicts, verifies and critiques the results of experiments carried out		[SK4] test/exam - oral or written		
	[OŚMU2_W05] Describes development directions and the latest discoveries in the field of scientific disciplines related to environmental protection.		discusses the energy situation of the country and the world lists and defines the basic types of renewable energy discusses the advantages and disadvantages of renewable energy production and use		[SW4] test/exam - oral or written		
	[OŚMU2_U01] On the basis of the acquired knowledge, proposes to solve environmental problems.		discusses the pros and cons of producing and using energy from renewable sources discusses the energy situation of the country and the world		[SU4] test/exam - oral or written		

Subject contents	Students will gain knowledge of renewable energy sources and innovative solutions to improve energy efficiency. Topics will include: renewable energy sources (RES) including solar energy (photovoltaics, solar panels), wind energy, hydropower (hydroelectric, tidal and wave power plants), solid biomass, liquid biomass and biogas (combustion and fermentation technologies), geothermal and energy storage technologies (batteries, hydrogen, heat storage)		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	exam	51.0%	100.0%
Recommended reading	Basic literature	1. Proekologiczne odnawialne źródła energii, W.M. Lewandowski, WNT 2012 2. Biopaliwa, W.M. Lewandowski, M. Ryms, WNT 2013	
	Supplementary literature	Biopaliwa, technologie dla zrównoważonego rozwoju, E. Klimiuk, M. Pawłowska, T. Pokój, PWN 2012	
	eResources addresses		
	Example issues/ example questions/ tasks being completed	1 Describe the operation of dye-sensitized solar cells 2 List and describe methods of generating hydrogen from water 3 Describe the process of producing biofuel	
Work placement	Not applicable		

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