

Course title Wykład dyplomowy - Energia odnawialna / Diploma lecture - Renewable energy		ECTS code 13.3.0600	
Name of unit administrating study Faculty of Chemistry			
Studies			
Field of study	Type	Form	
Chemistry	Bachelor	Full-time studies	
Teaching staff prof. dr hab. Ewa Siedlecka, dr inż. Aleksandra Pieczyńska			
Forms of classes, the realization and number of hours		ECTS credits 2	
A. Forms of classes, in accordance with the UG Rector's regulations lecture		classes - 30 h tutorial classes – 5 h student's own work – 15 h	
B. The realization of activities in-class learning		Total: 50 h - 5 ECTS	
C. Number of hours 30 h lecture			
The academic cycle Third year, summer semester			
Type of course elective		Language of instruction Polish	
Teaching methods Lecture with multimedia presentation		Form and method of assessment and basic criteria for evaluation or examination requirements	
		A. Final evaluation, in accordance with the UG study regulations course completion (with a grade)	
		B. Assessment methods written exam: open questions (short written answer)	
		C. The basic criteria for evaluation or exam requirements <ul style="list-style-type: none"> • positive mark from the written exam covering the issues listed in the program content of the lecture, the scale according to the UG Study Regulations • oral exam - supplement of the written exam, but only for those students who obtained from the written test 40 - 50% of the points possible to receive, 	
Required courses and introductory requirements basics of general chemistry			
Aims of education <ul style="list-style-type: none"> • familiarize students with the energy situation of the country and the world • familiarization with renewable energy sources and ways to obtain it • familiarize students with the types of biofuels, their production and application 			
Course contents subjects of the lecture: Characteristics of renewable energy sources. Conditions of energy policy in the 21st century - forecasts for the future. Discussion of the methods of obtaining solar, wind, geothermal energy, tidal waters. Heat pumps. Photovoltaic cells. Solar panels. Wind turbines. Biomass energy resources. Energy plants - raw material for energy production, liquid and gas biofuels. Characteristics and production technologies of gas and liquid biofuels. Utilization and management of waste generated during the production of biofuels. Hydrogen as a fuel of the future.			

Bibliography of literature

A. Literature required to pass the course

1. Lewandowski W.M. Proekologiczne źródła energii odnawialnej, WNT W-wa 2001
2. Taubman J., Węgiel i alternatywne źródła energii, PWN W-wa 2011.
3. Gradziuk P., Kowalczyk K., Kościk B., Biopaliwa, Wydawnictwo Wieś Jutra 2002r.
4. Wandrasz J.W., Wandrasz A.J., Paliwo formowane, Wydawnictwo Seidel-Przywecki, 2006r.
5. Juliszewski T., Zając T. Biopaliwo rzepakowe. Państwowe wydawnictwo Rolnicze i Leśne 2008r.

A.2. studiowana samodzielnie przez studenta

1. Pandey A., Handbook of plant-based biofuels, CRC Press Taylor & Francis Group, 2009

B. Extracurricular readings

Knowledge

1. discusses the energy situation of the country and the world
2. lists and defines basic types of renewable energy
3. lists and characterizes the basic ways of acquiring renewable energy
4. classifies raw materials and appropriate technologies for the production of biofuels
5. uses the basic technological and chemical concepts describing the process of obtaining renewable energy
6. discusses the advantages and disadvantages of the production and use of energy from renewable sources.

Skills

1. in a clear way, both in speech and in writing, present correct technological reasoning,

Social competence

1. understands the need to save energy and obtain it from renewable sources,
2. understands the need for further education,