

Course title Wykład monograficzny - Zielone technologie/ Monographic lecture - Green technology		ECTS code 13.3.0520	
Name of unit administrating study Faculty of Chemistry			
Studies			
Field of study	Type	Form	
Chemistry	Masters	Full-time studies	
Teaching staff Prof. dr hab. Ewa Siedlecka			
Forms of classes, the realization and number of hours		ECTS credits 3	
A. Forms of classes, in accordance with the UG Rector's regulations lecture		classes - 30 h tutorial classes – 10 h student's own work – 35 h	
B. The realization of activities in-class learning		Total: 75 h - 3 ECTS	
C. Number of hours 30 h lecture			
The academic cycle Second year, winter semester			
Type of course obligatory		Language of instruction Polish	
Teaching methods Lecture with multimedia presentation Case study lecture		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 Oral test	
		C. The basic criteria for evaluation or exam requirements grade criteria in accordance with the UG Studies Regulations	
Required courses and introductory requirements basics of general chemistry			
Aims of education Acquiring knowledge about principles of green technology, sustainable development and chemical safety in industry Familiarization with unconventional reactions, alternative reagents and reaction media in technological processes			
Course contents The philosophy of green chemistry, the principles of green technology. The concept of sustainable development. Chemical safety in industry. Green technologies in organic synthesis: new types of reactions, advanced catalytic processes, alternative reagents and reaction media. Biomass as a substrate in organic synthesis. Ionic and fluoro liquids as modern solvents and reagents. Reactions without solvents. New ways of carrying out the reaction. Electrochemical reactions - the use of new electrode materials. Fuel cells. Photochemical reactions. Synthesis supported by microwave radiation. Reactions supported by acoustic waves. Examples of eco-investments in the chemical and food industry, industrial waste technologies and hazardous substances			
Bibliography of literature			
A. Literature required to pass the course			
1. Burczyk B. Zielona Chemia, Oficyna Wydawnicza Politechniki Wrocławskiej, Wrocław 2006			
2. Lewandowski W.M. Proekologiczne źródła energii odnawialnej, WNT W-wa 2001			
3. Gradziuk P., Kowalczyk K., Kościuk B., Biopaliwa, Wydawnictwo Wieś Jutra 2002r.			
B. Extracurricular readings			

Knowledge

Student:

1. lists and defines the concepts of green technology, sustainable development, eco-development, eco-innovation, etc.
2. discusses alternative ways of chemical reaction
3. explains the concept of alternative reagents and reactionary media
4. explains the catalysis process
5. lists examples of green technologies in the chemical, food and environmental industries

Skills**Social competence**

Student:

- understands the importance of further education
- is aware of the dangerous caused by degradation of the natural environment and understand the importance of the improving technology.