COURSE DESCRIPTION CARD - SYLLABUS

Course name
Zielona chemia i utylizacja odpadów elektrochemicznych (Green chemistry and utilization of electrochemical waste)

Course

Field of study	Year/Semester
Technologia chemiczna (Chemical Technology)	II/3
Area of study (specialization)	Profile of study
Elektrochemia techniczna (Technical Electrochemistry)	general academic
Level of study	Course offered in
Second-cycle studies	Polish
Form of study	Requirements
full-time	compulsory

Number of hours

Lecture	Laboratory classes	Other (e.g. online)
15		
Tutorials	Projects/seminars	

Number of credit points

2

Lecturers

Responsible for the course/lecturer:
dr hab. Małgorzata Osińska

Responsible for the course/lecturer:

Prerequisites

Has the necessary knowledge of chemistry to enable understanding of chemical phenomena and processes.

Has the necessary knowledge about raw materials, products and processes used in chemical technology.

Course objective

Obtaining knowledge about the principles and assumptions of green chemistry focused on sustainable development, i.e. the production of a safe chemical product by modern, economic methods, while protecting the natural environment and the utilization and recovery of electrochemical waste.

Course-related learning outcomes

Knowledge

1. Has expanded and depth knowledge in the field of green chemistry, allowing to formulate and solve complex tasks related to chemical technology. - [K_W2]

2. Has expanded knowledge of environmental problems related to the implementation of chemical processes. - [K_W8]

Skills

1. Is able to determine independently the directions of further education and implement self-education. - [K_U5]

2. Has the ability to adapt knowledge in the field of green chemistry to solve problems in the field of chemical technology and planning new industrial processes. - [K_U12]

3. Is able to plan rationally the use of natural resources in the chemical industry, guided by the principles of environmental protection and sustainable development. - [K_U13]

Social competences

1. Is aware of the limitations of science and technology related to environmental protection. - [K_K2]

2. Understands the need to provide to the public of information on the current state and directions of development of chemical technology, on the principles of use and handling of chemical products, about the risks associated with obtaining raw materials, chemical production and distribution. - [K_K7]

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

A written final credit course.

Programme content

Standards and regulations regarding environmental protection and measures applied to prevent water, soil and atmosphere pollution with solid, liquid, gas and dust waste. Technological possibilities of waste reduction, recycling, methods used for material recovery. Methods for stabilizing and solidifying solid and liquid waste.

Teaching methods

Lecture.

Bibliography

Basic

1. T.Stefanowicz, Gospodarka wodno-ściekowa i odpadowa w przemyśle elektrochemicznym, Wyd. Politechniki Poznańskiej, Poznań, 2001.

2. T.Stefanowicz, Otrzymywanie i odzysk metali oraz innych surowców ze ścieków i odpadów pogalwanicznych, Wyd. Politechniki Poznańskiej, Poznań, 1992

Additional

1. B.Bartkiewicz, Oczyszczanie ścieków przemysłowych, Wyd. Naukowe PWN, Warszawa 2010.

2. L.K Wang, N.K. Shammas, Y.-T. Hung (eds) Advances in Hazardous Industrial Waste Treatment CRC Press, Taylor and Francis Group, Boca Raton Fl. USA 2009.

Breakdown of average student's workload

	Hours	ECTS
Total workload	50	2,0
Classes requiring direct contact with the teacher	25	1,0
Student's own work (literature studies, preparation for test)[1]	25	1,0

[1] delete or add other activities as appropriate