GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Chemistry, PG_00055862		
Field of study	Power Engineering, Power Engineering, Power Engineering		
Date of commencement of studies	October 2021	Academic year of realisation of subject	2021/2022
Education level	first-cycle studies	Subject group	Obligatory subject group in the field of study
Mode of study	Full-time studies	Mode of delivery	at the university
Year of study	1	Language of instruction	Polish
Semester of study	1	ECTS credits	2.0
Learning profile	general academic profile	Assessment form	exam
Conducting unit	Department of Sanitary Engineering -> Faculty of Civil and Environmental Engineering		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Klaudia Kosek	
	Teachers	dr inż. Agnieszka Kalinowska dr hab. inż. Aneta Łuczkiewicz dr inż. Małgorzata Szopińska dr inż. Klaudia Kosek	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	0.0	15.0	0.0	0.0	30

E-learning hours included: 0.0

Adresy na platformie eNauczanie:
Chemia dla kierunku Energetyka (WIMiO, WILiŚ, WEiA) - Moodle ID: 18059
https://enauczanie.pg.edu.pl/moodle/course/view.php?id=18059
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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

Introducing students to the basic concepts and laws of chemistry, phase transitions and their meaning in energy. Provision of knowledge about laboratory vessels and equipment. Introduction to research analytics, including titration analysis, as well as instrumental methods of analysis. Learning the basics of electrochemistry, presenting issues related to boiler water, including: basic concepts, parameters, water hardness, degassing. Introducing students to the basics of metal corrosion as well as flue gas desulphurization.

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K6_U10] can use correctly selected methods and measuring devices for determination of basic parameters during the water treatment process and wastewater treatment control; can perform basic laboratory tests leading to the assessment of water quality, pollutant load in wastewater	The student has knowledge of research equipment used in chemistry, knows the techniques of determining chemical compounds and is able to perform simple determinations independently in a variety of matrices and has knowledge of analytical instrumental methods used in the power industry. Based on the research, the student is able to assess the state of the environment, including the degree of its transformation as a result of the accumulation of pollutants, e.g. in sewage.	[SU1] Assessment of task fulfilment [SU4] Assessment of ability to use methods and tools
	[K6_K01] is aware of the need for training and self-improvement in the profession of energy and the possibility of further education; can think and act in a creative and entrepreneurial manner; can define priorities for the implementation of an individual or group task	The student's knowledge includes knowledge about self-improvement and education in the field of energy. He knows the basic laws of chemistry used in energy and is able to use them in practice.	[SK3] Assessment of ability to organize work [SK5] Assessment of ability to solve problems that arise in practice [SK1] Assessment of group work skills
	[K6_W02] has a basic knowledge of physics (including optics, electricity and magnetism), chemistry, technical thermodynamics, fluid mechanics and general mechanics needed to understand and describe the basic phenomena occurring in devices and systems, energy plants and transmission networks and their environment	The student is able to apply the acquired knowledge of physics and chemistry, fluid mechanics and general mechanics to perform laboratory tasks (including computational tasks), which are the basis in the energy sector.	[SW1] Assessment of factual knowledge
Subject contents	Basic chemical concepts, structure of the atom, systematics and laws of chemistry, division and transformation of chemical reactions, phase transformations and their importance in energy, division of chemical elements, vessels and laboratory equipment, basic analytical concepts, titration analysis, instrumental methods of analysis, dispersion systems , colloids, emulsions, basics of electrochemistry, polymers and plastics, boiler water - basic concepts, parameters, water hardness, degassing, basics of metal corrosion, flue gas desulphurization.		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Entrance tests for laboratories/ Reports	60.0%	50.0%
	Exam	60.0%	50.0%
Recommended reading	Basic literature	L. Jones, P. Atkins, L. Leroy, General Chemistry, Polish Scientific Publishers PWN, Warsaw 2020 J.K. Dawson, G. Long, Chemistry of nuclear power, Londyn 1959, G. Newnes LTD K.M. Pazdro, W. Danikiewicz, Basics of Chemistry Part I. General Chemistry, Polish Chemical Society, Educational Oficyna. Warsaw 1995 K.M. Pazdro, W. Danikiewicz, Basics of Chemistry Part II. Elements and chemical compounds, Polish Chemical Society, Oficyna Edukacyjna, Warsaw 1995	
	Supplementary literature	J.J. Thompson, Introduction to Chemical Energetics (Concepts in Chemistry), International Edition, October 1, 1969	
	eResources addresses	Chemia dla kierunku Energetyka (WIMiO, WILiŚ, WEiA) - Moodle ID: 18059 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=18059 Chemia dla kierunku Energetyka (WIMiO, WILiŚ, WEiA) - Moodle ID: 18059 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=18059	

Example issues/ example questions/ tasks being completed	Examples of the occurrence of phase transformations in the power industry, what is the division of chemical elements, how to distinguish measuring vessels in the laboratory, the concept: titration analysis, examples of the use of instrumental methods of analysis, electrochemistry in power industry, determination of boiler water hardness, the concept: aggressive carbon dioxide
Work placement	Not applicable