GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Hydrogen power and fuel cells, PG_00037309		
Field of study	Technical Physics		
Date of commencement of studies	October 2022	Academic year of realisation of subject	2024/2025
Education level	first-cycle studies	Subject group	Optional subject group Subject group related to scientific research in the field of study
Mode of study	Full-time studies	Mode of delivery	at the university
Year of study	3	Language of instruction	Polish
Semester of study	5	ECTS credits	1.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Electrochemistry, Corrosion and Materials Engineering -> Faculty of Chemistry		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Łukasz Gaweł	
	Teachers	dr inż. Łukasz Gaweł	

Lesson types and methods of instruction

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	2.0	8.0	25

Subject objectives

Learning the principles of operation of various types of fuel cells.Familiarization with problems related to the construction and proper operation of fuel cells.

Learning outcomes

Course outcome	Subject outcome	Method of verification
K6_W02	Has structured knowledge of the basics of physics in the field of hydrogen energy and fuel cells	[SW1] Assessment of factual knowledge
K6_U01	Is able to independently use textbooks and selected literature	[SU1] Assessment of task fulfilment
K6_W01	Gets acquainted with the achievements of physics in the 21st century and understands its role in the development of civilization and modern technique and technology	[SW1] Assessment of factual knowledge

Subject contents

Historical outline and types of fuel cells; hydrogen- basic properties and methods of preparation; structure and electrochemistry of cells; efficiency, losses in the cell, influence of operating parameters, structure of cells and electrolyzers

Prerequisites and co-requisites

1. Knowledge of the basics of organic and inorganic chemistry.
2. Knowledge of the basics of thermodynamics of chemical reactions.
3. Knowledge of the basics of electrochemistry.
4. Knowledge of the basics of electrical circuit theory

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Written assessment of the lecture	60.0%	100.0%

Recommended reading	Basic literature	1. J. Larminie, A. Dicks ,,Fuel cell systems explained, Willey, 2003. 2. K. Kordesh, G.Simader ,,Fuel cells and their applications, VCH, 2001.
	Supplementary literature	1. P. W. Atkins: ,,Chemia fizyczna", PWN, Warszawa 2001.
	eResources addresses	Adresy na platformie eNauczanie: Energetyka wodorowa i ogniwa paliwowe - Moodle ID: 40390 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=40390
Example issues/ example questions/ tasks being completed	Derivation of the formula describing the electromotive force of a lossless hydrogen fuel cell.The influence of the presence of water on the operation of a PEM cell.	
Work placement	Not applicable	

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