GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	ELECTROCHEMICAL ENERGY SOURCES, PG_00064331		
Field of study	Chemical Technology		
Date of commencement of studies	February 2025	Academic year of realisation of subject	2024/2025
Education level	second-cycle studies	Subject group	Optional subject group Specialty 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	1	Language of instruction	Polish
Semester of study	1	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	exam
Conducting unit	Department of Corrosion and Electrochemistry -> Faculty of Chemistry		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Artur Zieliński	
	Teachers	dr hab. inż. Artur Zieliński mgr inż. Zuzanna Zarach	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	0.0	30.0	0.0	0.0	45

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	45	5.0	25.0	75

Subject objectives

Familiarization with the principles of operation and practical implementation of various electrochemical energy sources.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_U02] carries out experiments using properly selected techniques and apparatus, taking advantage of new developments in technology and related fields	The student is able to translate theoretical knowledge about the thermodynamics and kinetics of electrode processes into understanding the operation of various energy sources.	[SU1] Assessment of task fulfilment
[K7_K01] critically evaluates the content of cognitive and practical problems	The student is able to carry out diagnostics and optimization of a specific variant of an energy source.	[SK4] Assessment of communication skills, including language correctness
[K7_W01] defines the phenomena, processes and laws of nature used to produce consumer goods and provide services	The student is able to design a medium-scale implementation of a selected electrochemical process.	[SW1] Assessment of factual knowledge

Subject contents

Physicochemistry of electrode processes. Primary cells, batteries, fuel cells. Photovoltaic cells as an example of electrochemistry of solids.

Prerequisites and co-requisites

Electrochemistry, physical chemistry

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
laboratory	100.0%	50.0%
lecture	50.0%	50.0%

Recommended reading	Basic literature	Electrochemical Power Sources: Batteries, Fuel Cells, and Supercapacitors By Vladimir S. Bagotsky, Alexander M. Skundin and Yury M. Volfkovich (A.N. Frumkin Institute of Physical Chemistry and Electrochemistry of the Russian Academy of Science, Russia), John Wiley & Sons Inc, New Jersey, USA, 2015, 372 pages, ISBN: 978-1-118-46023-6
	Supplementary literature	publications from the JCR list
	eResources addresses	Uzupełniające Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	1. Please discuss what energy and power density are. What is the significance of the above parameters from the point of view of the usability of the cell? 2. Please describe the discharge characteristics of the selected cell. What characteristic points can be distinguished on it? 3. Please discuss one disadvantage and one advantage of primary magnesium cells. 4. How does the efficiency of the cell change as a function of temperature. Which cells are the best in this respect? 5. Please characterize lithium cells with solid electrolyte.	
Work placement	Not applicable	

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