GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	, PG_00057504		
Field of study	Nanotechnology		
Date of commencement of studies	October 2020	Academic year of realisation of subject	2022/2023
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	6	ECTS credits	4.0
Learning profile	general academic profile	Assessment form	assessment

Conducting unit	Instytut Nanotechnologii i Inżynierii Materiałowej -> Faculty of Applied Physics and Mathematics	
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Jacek Ryl
	Teachers	dr hab. inż. Jacek Ryl dr hab. inż. Beata Bochentyn dr inż. Marta Prześniak-Welenc dr hab. inż. Natalia Wójcik

Lesson types and methods of instruction

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

Subject objectives

The aim of the course is to familiarize students with the role of electrochemical processes in the world of science and industry, including in particular the possibilities of using electrode phenomena in practice, e.g. in electricity storage technologies, mechanisms of catalyzing chemical processes, mechanisms of electrochemical sensors operation, anti-corrosion technologies, water and wastewater treatment technologies, synthesizing thin-film systems, etc. Electrochemical measurement techniques will be presented and discussed as part of the course.

Learning outcomes

Course outcome	Subject outcome	Method of verification
K6_K05		
K6_U06		
K6_W07		

Subject contents

- Fundamentals of electrochemistry
- DC measurements
- AC measurements
- Electroanalysis, electrochemical sensors
- Electrochemical energy storage devices
- Fuel cells
- Photo and electrocatalysis
- Electrochemical water treatment
- Corrosion and protection against corrosion
- Electrochemical techniques for applying thin layers

Prerequisites and co-requisites

Knowledge of the structural properties of materials, solid state physics, chemistry, surface physico-chemistry. Basics in electrical engineering and physical chemistry are valuable.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Lecture module	60.0%	50.0%
Practical training module	60.0%	50.0%

Recommended reading	Basic literature	P. Atkins - Chemia Fizyczna K. Pigoń, Z. Ruziewicz - Chemia FIzyczna A. Czerwiński - Akumulatory, baterie, ogniwa
	Supplementary literature	Publications in journals from the ISI list, presented during lectures
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	What is the role of each electrode in the measuring system? The role of diffusion in electrochemical processes Describe the mechanisms of selected forms of anti-corrosion protection Why are lithium ion batteries the most widely used today, what are the alternatives? Diversify anodic and cathodic electrochemical coating technologies	
Work placement	Not applicable	