COURSE DESCRIPTION CARD - SYLLABUS

Course name
Electrochemistry

Course

Field of study
Electromobility

Year/Semester
2/3

Area of study (specialization)

Profile of study
general academic

Level of study
First-cycle studies

Course offered in
polish

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture	Laboratory classes	Other (e.g. online)
	30	
Tutorials	Projects/seminars	

Number of credit points

3

Lecturers

Responsible for the course/lecturer:
PhD, DSc, Eng. Grzegorz Lota, Associate Professor

Faculty of Chemical Technology

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Responsible for the course/lecturer:
PhD, DSc, Eng. Marek Baraniak

Faculty of Chemical Technology

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Prerequisites

The student has a basic knowledge of chemistry, physics and mathematics acquired at high school.

The student has knowledge of the basics of electrochemistry acquired during the course.

The student is aware of the limitations of his own knowledge and understands the need for further improvement (training).

Course objective

The aim of the course is to provide students with knowledge of electrochemistry, electrochemical processes, with particular emphasis on chemical power sources.

Course-related learning outcomes

Knowledge

Student has an ordered and theoretically founded basic knowledge in the field of chemistry and electrochemistry, including the area of electrochemical and chemical power sources

Skills

Student is able to plan and carry out experiments, including measurements of basic measurable quantities characteristic for electromobility in typical and not fully predictable conditions; is able to present the obtained results in numerical and graphic form, interpret them and draw appropriate conclusions

Student can, when formulating and solving tasks related to electromobility, see their systemic and non-technical aspects, including environmental, economic and legal

Social competences

Student understands the importance of knowledge in solving problems in the field of electromobility; is aware of the necessity to use the knowledge of experts when solving engineering tasks beyond their own competences

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

1. Ongoing control of knowledge and skills during laboratory exercises.

2. Assessment of oral and written answers on the issues related to the laboratory exercise.

Programme content

1. Mechanism and kinetics of electrode processes.

2. Corrosion.

3. Electroplating.

4. Electrochemical energy storage; the principle of operation, structure, construction, operating characteristics.

5. Lithium-ion batteries.

6. Nickel - hydride batteries.

7. Lead-acid batteries

8. Supercapacitors.

Teaching methods

Laboratory classes

Bibliography

Basic

1. A.Ciszewski, Technologia chemiczna, procesy elektrochemiczne, Wydawnictwo Politechniki Poznańskiej, Poznań 2008.

2. A. Czerwiński, Akumulatory, bateria, ogniwa, WKŁ, Warszawa 2005.

Additional

3. H. Sholl, T. Błaszczyk, P. Krzyczmonik, Elektrochemia. Zarys teorii i praktyki, Wydawnictwo Uniwersytetu Łódzkiego, Łódź 1998.

4. A. Kisza, Elektrochemia. Tom I: Jonika, WNT, Warszawa 2000.

5. A. Kisza, Elektrochemia. Tom II: Elektrodyka, WNT, Warszawa 2000.

6. H. Bala, Korozja materiałów – teoria i praktyka, WIPMiFS, Częstochowa 2000.

7. M. Świerżewski, Chemiczne źródła prądu elektrycznego, Wydawnictwo SEP COSIW 2013.

Breakdown of average student's workload

	Hours	ECTS
Total workload	70	3,0
Classes requiring direct contact with the teacher	40	2,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) [1]	30	1,0

[1] delete or add other activities as appropriate