



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Electrochemistry

### Course

Field of study

Electromobility

Area of study (specialization)

Level of study

First-cycle studies

Form of study

full-time

Year/Semester

1/2

Profile of study

general academic

Course offered in

polish

Requirements

compulsory

### Number of hours

Lecture

30

Laboratory classes

Tutorials

Projects/seminars

Other (e.g. online)

### Number of credit points

2

### Lecturers

Responsible for the course/lecturer:

PhD, DSc, Eng. Grzegorz Lota, Associate Professor

Responsible for the course/lecturer:

Faculty of Chemical Technology

e-mail: grzegorz.lota@put.poznan.pl

tel. 61 665 21 58, 59

### Prerequisites

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

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 use literature sources, integrate obtained information, evaluate it and interpret it and draw conclusions in order to solve complex and unusual problems in the field of electromobility

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

#### 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. Written final exam.

#### Programme content

1. Fundamentals of electrochemistry.
2. Mechanism and kinetics of electrode processes.
3. Corrosion.
4. Electroplating.
5. 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

Lecture

#### 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. Błaszczak, P. Krzyczmonik, Elektrochemia. Zarys teorii i praktyki, Wydawnictwo Uniwersytetu Łódzkiego, Łódź 1998.
4. A. Kiszka, Elektrochemia. Tom I: Jonika, WNT, Warszawa 2000.
5. A. Kiszka, 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	52	2,0
Classes requiring direct contact with the teacher	32	1,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) <sup>1</sup>	20	1,0

<sup>1</sup> delete or add other activities as appropriate