



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Fundamentals of electrochemical technology [S1TCh2>PTE]

### Course

Field of study

Chemical Technology

Year/Semester

3/6

Area of study (specialization)

–

Profile of study

general academic

Level of study

first-cycle

Course offered in

polish

Form of study

full-time

Requirements

compulsory

### Number of hours

Lecture

30

Laboratory classes

30

Other (e.g. online)

0

Tutorials

0

Projects/seminars

0

### Number of credit points

5,00

### Coordinators

dr hab. Piotr Krawczyk prof. PP  
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### Lecturers

### Prerequisites

Student has a ordered knowledge of mathematics and physical chemistry and he also has ability to use the basic techniques in a laboratory scale.

### Course objective

The aim of the course is to familiarize students with an overview of technical electrochemistry methods and develop skills for their practical application.

### Course-related learning outcomes

Knowledge:

1. The knowledge in the field of basics of electrochemical processes -[ K\_W03, K\_W08, K\_W10],
2. The knowledge in the field of various electrochemical technologies -[ K\_W12, K\_W13, K\_W15].

Skills:

1. The student has the ability to plan the technological processes, the selection of measurement techniques, he also has ability to define the appearing chemical reactions and the yielded products - [K\_U16, K\_U18, K\_U20, K\_U22],

2. The student has the ability to acquire information from the different of sources and he use a specialized vocabulary in English -[K\_U01, K\_U03].

Social competences:

1. The student understands the need for self-study and improvement of their professional competence -[K\_K01],
2. Student can act and cooperate in the group -[K\_K03].

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Rating of written answers within the subjects related to the theme of the practical classes.

Checking of current knowledge and practical skills, the ability to conduct experiments corectly during laboratory classes. Performing all laboratory exercises provided for the study program. Final mark of the laboratory class will correspond to the mean marks of the previously performed written answers.

In the case of on-line classes, the knowledge check will be carried out in the form of a test consisting of 3 - 5 questions for each exercise and report for the given experimental data.

The knowledge acquired during the lecture is verified by a written final exam in the subject consisting of 3 questions. Passing threshold will correspond to 51% of the maximum number of points.

In the case of on-line classes, the exam will take the form of a test consisting of 20 test questions and five open questions. Passing threshold: 51% of the maximum number of points.

### Programme content

1. The principles of electrochemical processes.
2. Electrodes balances.
3. The mechanisms of electrode processes.
4. The kinetics of electrode processes.
5. The selected electrochemical processes used for synthesis of chemical compounds and environmental protection.
6. The technological processes based on the electrochemical processes.
7. The selected issues in the field of generation, conversion and storage of electrical energy in chemical power sources.
8. Construction of electrochemical reactors and their influence on the course of electrochemcial processes.
9. Fundamentals of corrosion processes.

### Teaching methods

Lecture, problem lecture, explanation, didactic discussion, classes, project method, laboratory exercises

### Bibliography

Basic:

1. A. Kiszka - Elektrochemia cz. I i II (Jonika i Elektrodyka) WNT, W-wa, 2001,
2. R. Dylewski, W. Gniot, M. Gonet, Elektrochemia przemysłowa, Wyd. Politechniki Śląskiej, 1999,
3. C.H. Hamann, A. Hamnett, W. Vielstich, Electrochemistry, Wiley-VCH, 2007,
4. A. Czerwiński, Ogniwa, akumulatory, baterie, WNT, W-wa, 1999,
5. C. G. Zoski praca zb., Handbook of Electrochemistry, Elsevier, 2007,
6. A. Ciszewski, Technologia chemiczna. Procesy elektrochemiczne, Wyd. Politechniki Poznańskiej, 2008.

Additional:

1. A.V. da Rosa, Fundamentals of Renewable Energy Processes, Elsevier/Academic Press, 1990,
2. H. Scholl, T. Błaszczuk, P. Krzyczmonik, Elektrochemia, Wyd. Uniwersytetu Łódzkiego, 1998.

### Breakdown of average student's workload

	Hours	ECTS
Total workload	125	5,00
Classes requiring direct contact with the teacher	64	2,50
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	61	2,50