COURSE DESCRIPTION CARD - SYLLABUS

Course name
Fundamentals of electrochemical technology

Course

Field of study
Chemical and process engineering

Year/Semester
3/5

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
30

Laboratory classes
30

Other (e.g. online)

Tutorials

Projects/seminars

Number of credit points

5

Lecturers

Responsible for the course/lecturer:
dr hab. Piotr Krawczyk, prof. PP

Responsible for the course/lecturer:

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_W04],

2. The knowledge in the field of various electrochemical technologies –[K_W13, K_W15],

3. The knowledge in the field of related fields –[K_W12].

Skills

1. The student has the ability to selection of measurement techniques –[K_U15, K_U16],

2. The student has the ability to use specialized vocabulary in English –[K_U01, K_U02].

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 accepting different roles –[K_K04].

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 of the sum of the above.

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 kinetics of electrode processes.

4. The selected electrochemical processes.

5. The processes based on the electrochemical processes.

6. Electrochemicl processes associated with the generation, conversion and storage of electrical energy.

7. Construction solutions of electrochemical reactors and their influnce on the course of electrochemcial processes.

Teaching methods

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

Bibliography

Basic

1. A. Kisza – 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. A. Czerwiński, Ogniwa, akumulatory, baterie, WNT, W-wa, 1999,

4. C. G. Zoski praca zb., Handbook of Electrochemistry, Elsevier, 2007,

5. 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. Błaszczyk, P. Krzyczmonik, Elektrochemia, Wyd. Uniwersytetu Łódzkiego, 1998.

Breakdown of average student's workload

	Hours	ECTS
Total workload	140	5,0
Classes requiring direct contact with the teacher	70	2,5
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) [1]	70	2,5

[1] delete or add other activities as appropriate