GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

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|---|---|---|---|
| Subject name and code | Technical electrochemistry, PG_00058345 | | |
| Field of study | Hydrogen Technologies and Electromobility | | |
| Date of commencement of studies | October 2022 | Academic year of realisation of subject | 2023/2024 |
| Education level | first-cycle studies | Subject group | Obligatory subject group in the field of study<br>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 | 2 | Language of instruction | Polish |
| Semester of study | 3 | ECTS credits | 4.0 |
| Learning profile | general academic profile | Assessment form | assessment |
| Conducting unit | Department of Corrosion and Electrochemistry -> Faculty of Chemistry | | |
| Name and surname of lecturer (lecturers) | Subject supervisor | dr hab. inż. Paweł Ślepski | |
| | Teachers | dr hab. inż. Paweł Ślepski<br>dr hab. inż. Stefan Krakowiak<br>dr hab. inż. Krzysztof Żakowski | |

**Lesson types and methods of instruction**

| Lesson type | Lecture | Tutorial | Laboratory | Project | Seminar | SUM |
|---|---|---|---|---|---|---|
| Number of study hours | 15.0 | 0.0 | 30.0 | 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 | 7.0 | 48.0 | 100 |

**Subject objectives**

The aim of the course is to provide students with an introduction to selected electrochemical methods applicable in industry and to master the skills of conducting electrochemical experiments in the field of industrial electrochemistry.

**Learning outcomes**

| Course outcome | Subject outcome | Method of verification |
|---|---|---|
| [K6_W19] has knowledge of the properties of electrolyte solutions, electrode processes and some electrochemical processes relevant to industrial practice and the application of electrochemistry in practice | The student is able to select the appropriate electrochemical technology to solve a technological problem. | [SW3] Assessment of knowledge contained in written work and projects<br>[SW1] Assessment of factual knowledge |
| [K6_U13] can use properly selected methods and devices enabling the measurement of basic quantities characterizing materials and technological processes | The student is able to control selected technical electrochemical processes. | [SU2] Assessment of ability to analyse information<br>[SU4] Assessment of ability to use methods and tools |
| [K6_U02] can work individually and in a team, can communicate using various techniques in a professional environment, as well as document and analyze the results of their work, can estimate the time needed to perform the entrusted task | The student is able to prepare and present results from an electrochemical process. | [SU1] Assessment of task fulfilment<br>[SU5] Assessment of ability to present the results of task |

**Subject contents**

Application of electrochemistry in corrosion monitoring and protection: electrochemical monitoring of corrosion rates, cathodic and anodic protection of industrial metal structures. Electrochemical application of metal coatings. Electrochemical wastewater treatment: electrocoagulation, electro-oxidation of organic compounds.

**Prerequisites and co-requisites**

The student has a basic knowledge of the mathematics of physics and the fundamentals of electrochemistry. The student has the ability to perform laboratory experiments in electrochemistry.

<table>
<tr><td>Assessment methods and criteria</td><td colspan="2"><table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>report</td><td>100.0%</td><td>40.0%</td></tr>
<tr><td>written exam</td><td>60.0%</td><td>60.0%</td></tr>
</table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td>R. Dylewski, W. Gnot, M. Gonet; Elektrochemia przemysłowa, WPŚ, Gliwice 1999<br><br>H. Bala; Korozja materiałów - teoria i praktyka, WIPMiFS, Częstochowa 2000.</td></tr>
<tr><td>Supplementary literature</td><td>journal: "Journal of Applied Electrochemistry", Springer</td></tr>
<tr><td>eResources addresses</td><td>Adresy na platformie eNauczanie:</td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="2">• electrochemical protection of steel in a sulphuric acid environment<br>• metallization - acid baths<br>• electro-oxidation of paracetamol</td></tr>
<tr><td>Work placement</td><td colspan="2">Not applicable</td></tr>
</table>

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