



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Corrosion Prevention Technologies

Course

Field of study

Chemical Technology

Area of study (specialization)

-

Level of study

First-cycle studies

Form of study

full-time

Year/Semester

IV/7

Profile of study

general academic

Course offered in

English

Requirements

elective

Number

of hours

Lecture

15

Laboratory classes

0

Other (e.g. online)

0

Tutorials

0

Projects/seminars

0

Number of credit points

2

Lecturers

Responsible for the course/lecturer:

dr inż. Magdalena Jeszka-Skowron

Responsible for the course/lecturer:

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Wydział Technologii Chemicznej

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Prerequisites

Student has basic knowledge of general, inorganic, organic and analytical chemistry as a result of the first, second and third years of engineering studies. He has basic skills in general, inorganic, organic and analytical chemistry resulting from the course of the first, second and third year of engineering studies and is aware of the scale of losses resulting from corrosive phenomena.

Course objective

The aim of this course is to acquire basic knowledge and skills in the field of mechanisms and methods of corrosion protection.



Course-related learning outcomes

Knowledge

W1. General knowledge of corrosion theory and the scale of its negative impact.

W2. Distinguishes between individual types and types of corrosion.

W3. Distinguishes between factors necessary for corrosion and factors having significant impact on it.

W4. Knows the different mechanisms of corrosion.

W5. Knows methods of corrosion measurements.

W5. Has general knowledge in the field of anti-corrosion protection technology.

K_W03, K_W04, K_W08, K_W15

Skills

Student: acquires skills in protection and corrosion protection

U1. Can evaluate the state of degradation of materials.

U2. Gains the ability to predict the behaviour of metals and alloys during exploitation in different types of environments.

U3. Gain in-depth skills in using Pourbaix corrosion charts.

U4. Knows how to select materials and protect them against corrosion.

K_U01, K_U04, K_U05, K_U10, K_U11, K_U13, K_U14, K_U16, K_U19, K_U24, K_U32

Social competences

K1. Understands the limitations of one's own knowledge, the need for lifelong learning and the need for self-education to improve one's own competences and one's professional environment.

K2. Has a sense of responsibility for the decisions he makes and acts ethically.

K_K01, K_K02, K_K05, K_K07

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

At the last lecture, there will be a final test, closing the lecture course on Corrosion Protection Technologies. The test (10-15 questions) will be in stationary form or on-line form on the e-kursy platform. During the lectures there is also the possibility of gaining points, which influence the final grade. Pass level is above 50%.

Programme content

1. Basic knowledge of corrosion phenomena, definition and speed of corrosion, corrosion products. 2. Corrosion of plastics, organic and ceramic materials. 3. Various types of corrosion (surface, pitting,



selective, stress, intercrystalline). 4. Introduction to electrochemistry of corrosive processes, kinetics of electrode processes, equilibrium potentials, Pourbaix charts. 5. Mechanisms of corrosion and metal passivation. 6. Necessary factors and factors accelerating corrosion. 7. Influence of various factors on corrosion processes of materials. 9. Methodology of corrosive testing. 8. Basic methods of protecting materials against corrosion (organic, inorganic, metallic - cathode and anode coatings), surface passivation, corrosion inhibitors. 10. Sacrificial protection. 11. Surface oxidation and passive coatings. 12. Current protection - cathode and anode. 13. Economic aspects of material protection against corrosion.

Teaching methods

Multimedia interactive lecture - students have the opportunity to ask questions, discuss and express their opinions also during the lecture.

Bibliography

Basic

1. Corrosion science and technology. David E. J. Talbot, James D. R. Talbot. Taylor & Francis (Londyn). Wydawca CRC Press/Taylor & Francis Group, 2018.
2. Design and corrosion control. V.R. Pludek. London : Macmillan Press, 1977.
3. Fundamentals of Corrosion: Mechanisms, Causes, and Preventative Methods (Corrosion Technology) Philip A. Schweitzer, CRC Press, 2009.

Additional

Current publications and reports on the protection of materials and structures against corrosion.

Breakdown of average student's workload

	Hours	ECTS
Total workload	50	2,0
Classes requiring direct contact with the teacher	25	1,0
Student's own work (literature studies, preparation for tests) ¹	25	1,0

¹ delete or add other activities as appropriate