COURSE DESCRIPTION CARD - SYLLABUS

Course name
Corrosion prevention technologies [S1TCh2>TZK]

Course

Field of study
Chemical Technology

Year/Semester
4/7

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
Polish

Form of study
full-time

Requirements
elective

Number of hours

Lecture
30

Laboratory classes
0

Other
0

Tutorials
0

Projects/seminars
0

Number of credit points

2,00

Coordinators

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Lecturers

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 end of the semester, there will be a final test, closing the lecture course on Corrosion Protection Technologies. During the lectures there is also the possibility of gaining points, which influence the final grade.

Programme content

Issues concerning basic knowledge and skills in the field of mechanisms and methods of corrosion protection.

Course topics

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

Mulimedia 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	2,00
Classes requiring direct contact with the teacher	30	1,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	20	1,00