



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Corrosion and degradation of engineering materials [S1ETI2>KiDM]

Course

Field of study

Education in Technology and Informatics

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

elective

Number of hours

Lecture

30

Laboratory classes

0

Other

0

Tutorials

0

Projects/seminars

0

Number of credit points

2,00

Coordinators

Lecturers

Prerequisites

Students should have basic knowledge of materials science, physics and chemistry, the ability to solve simple material problems based on their knowledge, and the ability to obtain information from indicated sources. They should also have the ability to think logically and obtain information from various sources and be willing to cooperate within a team. Moreover, they should understand the need to expand their competences.

Course objective

Providing students with information about the basic phenomena of destruction of engineering materials (metals and alloys, ceramics and glass and polymeric materials) and methods of protection against corrosion. Students should acquire the ability to select materials for work in corrosive conditions and to select an appropriate method of protection against corrosion.

Course-related learning outcomes

Knowledge:

As a result of the classes, the student:

1. Has basic knowledge of technical mechanics, strength of materials and general principles of engineering structures as well as technologies for producing and processing engineering materials
2. Has knowledge of current issues in materials engineering, functional materials and nanotechnology

3. Has knowledge about the ecological aspects of technical activities undertaken

Skills:

As a result of the classes, the student should demonstrate skills in the following areas:

1. Is able to obtain information from literature, databases and other sources, integrate it, interpret it and draw conclusions, formulate and justify opinions, as well as prepare and present an oral presentation and documented study on issues related to the field of education in Polish and English
2. Is able to select materials with appropriate physicochemical and structural properties for engineering applications, select appropriate manufacturing technologies to design products, their structure and properties, recognizing social, economic, ecological and legal aspects

Social competences:

As a result of the classes, the student will acquire the following competencies. Completing the course means that:

1. Is aware of the importance of engineering activities and its non-technical aspects, including the impact on the environment, and understands the need to provide information related to technology and IT in a generally understandable way

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: Assessment based on students' activity in discussions and solving group tasks

Programme content

Basic phenomena of destruction of engineering materials (metals and alloys, ceramics and glass and polymeric materials). Corrosion protection methods. Selection of materials for operation in corrosive conditions and selection of an appropriate corrosion protection method. Corrosion-resistant materials.

Course topics

1. Classification of corrosion phenomena,
2. Electrochemical corrosion: types of electrodes, electrode reactions, corrosion cells,
3. The passive state of metals.
4. Classification of corrosion types: uniform, local, crevice, pitting, intergranular, stress, fatigue, hydrogen, selective, biological.
5. Gas corrosion (high temperature).
6. Corrosive environments.
7. Corrosion of metal materials.
8. Corrosion of ceramic materials and glass.
9. Plastic degradation phenomena.
10. Methods of protecting engineering materials against corrosion.
11. Corrosion resistant materials.
12. Corrosion testing methods.

Teaching methods

Lecture: multimedia presentation, case study

Bibliography

Basic:

1. J. Baszkiewicz, M. Kamiński, Korozja materiałów, Oficyna wydawnicza PW, Warszawa 2006.
2. H. Bala, Korozja materiałów - teoria i praktyka, WIPMiFS, Częstochowa 2002.
3. JCR publications provided by the teacher during classes.

Additional:

1. JCR publications provided by the teacher during classes.

Breakdown of average student's workload

	Hours	ECTS
Total workload	55	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)	25	1,00