



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Corrosion and corrosion protection in industry and means of transport [S1MiTPM1>KiOpKwPiŚT]

Course

Field of study

Materials and technologies for automotive industry

Year/Semester

2/3

Area of study (specialization)

–

Profile of study

general academic

Level of study

first-cycle

Course offered in

Polish

Form of study

full-time

Requirements

compulsory

Number of hours

Lecture

15

Laboratory classes

15

Other

0

Tutorials

0

Projects/seminars

0

Number of credit points

2,00

Coordinators

prof. dr hab. inż. Jarosław Jakubowicz
jaroslaw.jakubowicz@put.poznan.pl

Lecturers

Prerequisites

Students should have a basic knowledge of materials science and chemistry. They should also have the ability to think logically and to obtain information from various sources as well as be ready to cooperate within a team. In addition, they should understand the need to learn and acquire new knowledge

Course objective

Providing information about corrosion phenomena and damage as well as methods of protection against corrosion in industry and means of transport, in particular in road vehicles

Course-related learning outcomes

Knowledge:

1. Students have knowledge about basic types of corrosion and methods of protection against corrosion.
2. Students have knowledge about the role of corrosion in motor vehicles.

Skills:

1. Students are able to interpret the effects of corrosion and propose a way to counteract it.
2. Students are able to carry out corrosion tests.

Social competences:

1. Students are able to cooperate in a group.
2. Students are aware of the role of corrosion and protection against corrosion in the modern automotive industry and for society.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

The knowledge acquired during the lecture is verified during the final colloquium lasting at least 45 minutes. There are two completion dates to which every student is entitled. In addition, students are entitled to make-up colloquium in the make-up session. The final test includes 3-5 questions. The passing threshold is a minimum of 50% of points.

Skills acquired as part of the laboratory classes are checked on an ongoing basis during each class in the form of an oral or written answer to the questions asked and assessed on the basis of reports from each laboratory exercise. Each laboratory exercise requires a positive evaluation. At the end of the semester, after completing compulsory exercises, there is a possibility to pass a make-up test of selected exercises.

Programme content

Corrosion processes, types of corrosion, factors influencing corrosion, methods of protection against corrosion, methods of corrosion testing and examples of corrosion damage with particular emphasis on the automotive industry.

Course topics

Lecture:

1. Electrochemical aspects of corrosion
2. Thermodynamical aspects of corrosion processes
3. Passivation of metals, the role of the passive layer in protection against corrosion
4. Types of corrosion: general, galvanic, crevice, pitting, intergranular, stress, fatigue, hydrogen, selective, microbiological, high temperature
5. Examples of corrosion damage in the automotive industry
6. Effect of environment on corrosion processes
7. Corrosion resistance of selected metals and their alloys.
8. Methods for corrosion protection: materials, protective coatings, modification of the environment, electrochemical protection
9. Methods of corrosion investigations.

Laboratory classes:

1. Identify of corrosion resistance based on polarization curves. part. 1.
2. Identify pf corrosion resistance based on polarization curves. part. 2.
3. High temperature corrosion. part. 1.
4. High temperature corrosion. part. 2.
5. Reasons of corrosive wear of automotive parts.

Teaching methods

Lecture in the form of a multimedia presentation

Laboratory exercises: macro- and microscopic observations; corrosive measurements; performance of tasks given by the teacher - practical exercises

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.

Additional:

1. W. Gumowska, E. Rudnik, I. Harańczyk, Korozja i ochrona metali, ćwiczenia laboratoryjne, AGH, Kraków 2007.

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