



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Corrosion-resistant materials [S1MiTPM1>MOnK]

### Course

Field of study

Materials and technologies for automotive industry

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

15

Laboratory classes

15

Other

0

Tutorials

0

Projects/seminars

0

### Number of credit points

2,00

### Coordinators

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### Lecturers

### Prerequisites

Basic knowledge of chemistry, materials science, metallurgy and heat treatment of materials. Ability to think logically, use information obtained from the library and the Internet.

### Course objective

Students receive a complete set of basic information to help understand corrosion phenomena, and are ready to find solutions to corrosive problems with metal materials.

### Course-related learning outcomes

Knowledge:

1. Has a structured knowledge of the chemistry and electrochemistry of corrosion processes occurring in various automotive materials.
2. Can characterize the structure and properties of automotive materials used in corrosive environments. Knows the operational problems of automotive products used in corrosive environments.
3. Knows test techniques in the field of corrosion resistance testing of automotive materials.

Skills:

1. Can plan and carry out experiments of the scope of corrosion processes of automotive materials and interpret the obtained results and draw conclusions.
2. Can analyze the causes of corrosion of vehicle components, evaluate and solve corrosion problems.

Social competences:

1. Understands the need to acquire knowledge in the field of corrosion of automotive materials.
2. Is aware of the importance of the problem of corrosion of automotive materials and understands the effects of corrosion of materials.

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: written credit at the end of the semester (credit if at least 51% of the points are obtained).

Laboratory: Credit on the basis of a written test/ oral answer and written studies from the realized program content during exercises. In order to receive credit, the written test/ oral answer and all reports must be passed with a positive mark.

### Programme content

Knowing the detailed information about the corrosion processes of various metallic materials and knowing with the basic groups of corrosion-resistant alloys and the characteristics of their corrosion resistance.

### Course topics

Lecture:

1. Types of corrosion and mechanisms of corrosive destruction of metals and alloys.
2. Classification of corrosion-resistant steels. Intergranular corrosion of austenitic corrosion-resistant steels.
3. Passivity, passivating metals and non-ferrous alloys.
4. Non-ferrous alloys resistant to corrosion.
5. Corrosion protection methods.
6. Corrosion resistance testing methods.

Laboratory:

1. Identification of the corrosion mechanism
2. Surface layers and corrosion-resistant coatings
3. Corrosion-resistant steels
4. Corrosion-resistant nickel alloys
5. Corrosion resistance of aluminum alloys. Anodizing of aluminum.

### Teaching methods

1. Lecture: multimedia presentation
2. Laboratory exercises: practical exercises, discussion and teamwork.

### Bibliography

Basic:

1. pod red. K. Darowicki, Procesy korozyjne, Politechnika Gdańska, Gdańsk 2008
2. J. Baszkiewicz, M. Kamiński, „Korozja materiałów”, Oficyna wydawnicza PW, Warszawa 2006
3. S. Mrowec, T. Werber, Korozja gazowa metali, Wydawnictwo Śląsk, Katowice 1975
4. M. Orman, A. Golian, Korozja aluminium i jego stopów, Wydawnictwo Śląsk, Katowice 1963

Additional:

1. L. A. Dobrzański „Podstawy nauki o materiałach i metaloznawstwo” WNT 2002
2. R.K. Tredhewey Corrosion, Longman, 1988

### Breakdown of average student's workload

	Hours	ECTS
Total workload	50	2,00
Classes requiring direct contact with the teacher	32	1,50
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	18	0,50