COURSE DESCRIPTION CARD - SYLLABUS

Course name
Corrosion-resistant alloys [S1IMat1>SOnK]

Course

Field of study
Materials Engineering

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

Knowledge: Knowledge of engineering materials, basic chemistry. Skills: Logical thinking, independent learning, using the library and the Internet. Social competences: The student is aware of the importance and understands the non-technical aspects and effects of engineering activities, including its impact on the environment.

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. the student should have detailed knowledge of k_w10 engineering materials
2. the student should have knowledge of chemistry to understand the structure of elements and chemical compounds; describe the elements of inorganic chemistry, acids, bases, salts, types of reactions, chemical equilibrium, chemical kinetics, electrochemistry, basics of metallurgy - [k_w03]

Skills:
1. the student is able to obtain information from literature, databases and other properly selected sources of materials engineering - [k_u01]
2. the student is able to identify and formulate simple engineering tasks of a practical nature, characteristic of materials engineering, including in particular the selection of materials for specific applications; define the working conditions of the materials. - [k_u16]
3. the student is able to select engineering materials, methods of shaping the structure and properties of materials for technical applications depending on the structure, properties and conditions of use - [k_u21]

Social competences:
1. the student understands the need for lifelong learning; can inspire and organize the learning process of other people - [k_k01]
2. the student correctly identifies and resolves dilemmas related to the profession - [k_k05]

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

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Lecture: written credit at the end of the semester (credit if at least 51% of points are obtained: <51% 2 - ndst, 51% -62% 3 - dst, 63% -74% 3.5 - dst +, 75% -84% 4 - db, 85% -94% 4.5 - db +,> 94% 5 - very good).
Laboratory: Credit based on a written test and written studies on the program content implemented during exercises. In order to pass the written test and all studies 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. J. Baszkiewicz, M. Kamiński, „Korozja materiałów”, Oficyna wydawnicza PW, Warszawa 2006
2. S. Mrowec, T. Werber, Korozja gazowa metali, Wydawnictwo Śląsk, Katowice 1975
3. M. Orman, A. Golian, Korozja aluminium i jego stopów, Wydawnictwo Śląsk, Katowice 1963
4. pod red. K. Darowicki, Procesy korozyjne, Politechnika Gdańska, Gdańsk 2008

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	35	1,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	15	1,00