



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Chemistry

### Course

Field of study

Engineering Management

Area of study (specialization)

Level of study

First-cycle studies

Form of study

full-time

Year/Semester

1/2

Profile of study

general academic

Course offered in

Polish

Requirements

elective

### Number of hours

Lecture

30

Laboratory classes

Tutorials

15

Projects/seminars

Other (e.g. online)

### Number of credit points

4

### Lecturers

Responsible for the course/lecturer:

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Responsible for the course/lecturer:

Faculty of Chemical Technology

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### Prerequisites

A student starting this subject should have the basic knowledge of chemistry at high school level. He also should have the basic skills related to the activities in the chemical laboratory and to be ready to cooperate in a team.

### Course objective

The aim of the course is to provide students with basic knowledge in the field of general chemistry, which is the chemical basis of material science, i.e. in the field of metal corrosion, the structure of the synthetic polymers and lubricants.

### Course-related learning outcomes

Knowledge



1. Student has extended knowledge about the systems, facilities and technical devices, student understands their role and importance in shaping economic organizations.
2. Student knows the basic issues of general chemistry.

#### Skills

1. Student has the ability to use the acquired knowledge, extended by a critical analysis of the effectiveness and usefulness of applied knowledge, in various areas and forms.
2. Student can make a critical analysis of existing technical solutions in a functioning business organization and propose their restructuring and improvement.
3. Student can describe the relevant chemical processes using chemical reaction equations.

#### Social competences

1. Student can note the cause-and-effect relationships in achieving the goals and rank the importance of alternative or competitive tasks.

#### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Partial assessment:

- a) in the scope of exercises: based on the evaluation of the current progress in the implementation of tasks assessed by written assignments - tests
- b) in the scope of lectures: based on answers to questions about the material learned in previous lectures,

Summative rating:

- a) in the scope of exercises based on the results of average partial grades
- b) in the scope of lectures: an exam consisting of test and open questions. You can take the exam after passing the exercises.

#### Programme content

The course program includes the following topics: Atom structure and periodic table of chemical elements. Chemical bonds. Systematics of inorganic compounds. Stoichiometry. Solutions and reactions occurring in aqueous electrolyte solutions. Oxidation and reduction reactions. Basics of electrochemistry. Metal corrosion on the example of steel, electrochemical corrosion mechanism, anode and cathode reactions. The role of electrolyte. Review of corrosion prevention methods. Non-metallic coatings. Metallic coatings. Sacrificial, cathodic and anode protection. Metal corrosion inhibitors. Basics of organic chemistry. Division of organic compounds. Chemical structure of polymers. Linear and crosslinked polymers. Polymer thermoplasticity. Review of the chemical structure of the most important polymers used.



## Teaching methods

Lecture - informative lecture

Exercises - exercise method

## Bibliography

Basic

1. A. Bielański, Podstawy chemii nieorganicznej, PWN, Warszawa 2008, tom I i II.
2. L. Jones, P. Atkins, Chemia ogólna. Częsteczki, materia, reakcje, PWN, Warszawa 2009.
3. I. Czarnecki, T. Broniewski, O. Henning, Chemia w budownictwie, Arkady, Warszawa, 1994; rozdziały: Chemia polimerów i Korozja materiałów metalicznych.

Additional

4. J. Minczewski, Z. Marczenko, Chemia analityczna, PWN, Warszawa, tom I i II.

## Breakdown of average student's workload

	Hours	ECTS
Total workload	100	4
Classes requiring direct contact with the teacher	45	2
Student's own work (literature studies, preparation for tutorials, preparation for tests/exam) <sup>1</sup>	55	2

<sup>1</sup> delete or add other activities as appropriate