COURSE DESCRIPTION CARD - SYLLABUS

Course name
Industrial chemistry [S1MiBP1>ChP]

Course

Field of study
Mechanical and Automotive Engineering

Year/Semester
1/1

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
0

Other
0

Tutorials
0

Projects/seminars
0

Number of credit points

1,00

Coordinators

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Lecturers

Prerequisites

The student has knowledge related to the basics of general chemistry, learns about the issues of raw materials, installations, technological lines in the chemical industry. The student is able to integrate the obtained information, interpret it, draw conclusions, formulate and justify opinions, is able to obtain information from literature and Internet sources. The student is able to formulate judgments on social issues, is aware of the importance of the chemical industry in the modern world, including industries related to transport.

Course objective

Structure of matter (atom, isotopes, radioisotopes, radioactivity, chemical elements and compounds, metals and non-metals), solution chemistry (percentage and molar concentration, solubility, the concept of electrolyte and non-electrolyte), electrochemistry (galvanic cells, batteries), corrosion, methods of material protection against corrosion, basic raw materials and processes of the chemical industry (fuels: solid, gaseous, liquid. Petroleum: composition, distillation, refining)

Course-related learning outcomes

Knowledge:

1. Has knowledge in the field of mathematics, including algebra, analysis, theory of differential equations, probability, analytical geometry necessary to: describe the operation of discrete mechanical systems, understand computer graphics methods, describe the operation of electrical and mechatronic systems.
2. Has knowledge in the field of physics, including the basics of classical mechanics, optics, electricity and magnetism, solid state physics, quantum and nuclear physics, necessary to understand specialist lectures in the field of the theory of construction materials and materials science, theory of machines and mechanisms, theory of electric drives and mechatronic systems.
3. Has basic knowledge in the field of chemistry, in the construction of the periodic table of elements and their properties, the theory of chemical bonds, organic and inorganic compounds, types of chemical reactions, chemical analysis: in the scope enabling understanding of lectures on metal and non-metal materials, protection sciences environment, fuels and lubricants, building materials and soil, biomechanics and biological materials processed by agricultural and food machinery.

Skills:
1. Can obtain information from literature, the Internet, databases and other sources. Can integrate the obtained information, interpret and draw conclusions from it, and create and justify opinions.
2. Can use learned mathematical theories to create and analyze simple mathematical models of machines and their elements, and simple technical systems.
3. Has the ability to self-educate with the use of modern teaching tools, such as remote lectures, websites and databases, teaching programs, e-books.

Social competences:
1. Is ready to recognize the importance of knowledge in solving cognitive and practical problems and to consult experts in case of difficulties in solving the problem on his own.
2. Is willing to think and act in an entrepreneurial manner.
3. Is ready to fulfill professional roles responsibly, including:
- observing the rules of professional ethics and requiring this from others,
- caring for the achievements and traditions of the profession.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Learning outcomes presented above are verified as follows:
Final test at the end of the semester.

Programme content

Basic knowledge of general and inorganic chemistry, incl. structure of matter, chemistry of solutions, electrochemistry and corrosion processes. Raw materials, chemical processes, installations, technological lines in the chemical industry. Distillation and rectification processes.

Course topics

The lecture program covers the following topics:
1. The structure of matter. Atom, isotopes, radioactivity. Metals and non-metals
2. Basic raw materials and processes of the chemical industry, with particular emphasis on crude oil and its processing
3. Surface phenomena
4. Basics of electrochemistry

Teaching methods

Lecture with the use of multimedia presentations.

Bibliography

Basic
1. Schmidt-Szałowski K., Sentek J., Podstawy technologii chemicznej. Procesy w przemyśle nieorganicznym". Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2004.
2. Kępiński J, Technologia chemiczna nieorganiczna. PWN, Warszawa 1975.

Additional

Breakdown of average student's workload

	Hours	ECTS
Total workload	25	1,00
Classes requiring direct contact with the teacher	15	0,50
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	10	0,50