COURSE DESCRIPTION CARD - SYLLABUS

Course name
Chemistry

Course

Field of study
Biomedical Engineering
Area of study (specialization)

Level of study
First-cycle studies
Form of study
full-time

Year/Semester
1/1
Profile of study
general academic
Course offered in
polish
Requirements
compulsory

Number of hours

Lecture
30
Laboratory classes
15
Other (e.g. online)

Tutorials
15
Projects/seminars

Number of credit points

6

Lecturers

Responsible for the course/lecturer:
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Wydział Technologii Chemicznej

ul. Berdychowo 4

60-965 Poznań

Responsible for the course/lecturer:
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Prerequisites

1. Basic knowledge of chemistry and mathematics (core curriculum for secondary schools, basic level)

2. Ability to solve elementary problems of chemistry based on possessed knowledge (e.g.: preparation of solutions with specific concentrations, usage of mathematical and chemical knowledge to physico-chemical calculations), the ability to acquire information from indicated sources)

3. Understanding the need of further education; willingness to cooperate with a team

Course objective

1. Obtaining knowledge from chemistry in the scope determined by the content of the curriculum, appropriate for the field of study

2. Development of skills to solve simple problems, perform simple experiments and analysis of results based on gained knowledge

3. Developing teamwork skills.

Course-related learning outcomes

Knowledge

1. The student is able to define the basic chemical concepts in the range of course content, appropriate for the field of study and give examples of their applications.

Skills

1. The student is able to perform standard measurements of basic chemical quantities.

2. The student is able to perform quantitative and qualitative analysis of the results of chemical experiments.

3. The student is able to give conclusions based on the results of calculations and measurements taken.

4. The student can understand the sources of knowledge indicated (list of basic literature) and acquire knowledge from other sources.

Social competences

1. The student is able to cooperate in a team, be responsible for his/her position in the team.

2. The student is able to actively participate in solving of basic tasks, set priorities for implementation of the task.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: knowledge acquired during the lecture is verified during the colloquium at the end of the semester. Passing threshold: 50% of points.

Laboratory: oral or written answers, evaluation of performed tasks and description of results obtained during experiments.Passing threshold: 50% of points.

Calculation exercises: tests. Passing threshold: 50% of points.

Programme content

Atomic structure, periodic table of elements, properties of elements and their compounds depending on their place in a table. Chemical bonds, structure of chemical compounds, complexes. Basic chemical laws and reaction types (acid-base, red-ox). pH scale. Metal potential table - redox potential.Corrossion - passivation, resistance and potential.Pourbaix diagram.Electrochemical basics – galvanic/ voltaic cells, Nernst potential, cell potentials (EMF). Basics of organic chemistry, classification of organic compounds, crude oil. Chemical structure of polymers. Linear and cross-linked polymers. Thermoplastic and thermo hardening polymers. Main polymers and their physical properties. States of matter and phase equilibria. Thermodynamic of chemical reactions. Surface effects – surface tension (surface active agents), adsorption – catalysts (catalysis).

Teaching methods

1. Lecture: multimedia presentation, discussion, problem solving.

2. Tutorials: problem solving, discussion.

3. Laboratory: performing experiments, solving tasks, discussion, teamwork.

Bibliography

Basic

1. L. Jones, P. Atkins, Chemia ogólna, PWN, W-wa, 2006

2. P. Atkins, Podstawy chemii fizycznej, PWN, W-wa, 1999

3. A. Lewandowski, S. Magas, Wiadomości do ćwiczeń laboratoryjnych z chemii fizycznej, Wydawnictwo Politechniki Poznańskiej, Poznań (skrypt nr 1765).

4. Z. Kurzawa ,Chemia, Wydawnictwo Politechniki Poznańskiej, Poznań (skrypt 1734)

5. K. Kelar, Chemia polimerów, Wydawnictwo Politechniki Poznańskiej, Poznań (skrypt 1604)

6. A.G. Whittaker, A.R. Mount, M.R. Heal, Krótkie wykłady. Chemia fizyczna, PWN, W-wa, 2007

7. G. Wranglem, Podstawy korozji i ochrony metali, WNT, W-wa, 1985

Additional

1. E. Ozimina, K. Sułko, Laboratorium z chemii budowlanej, Wyd. Politechniki Świętokrzyskiej w Kielcach, 2010

2. Z. Sarbak, Kataliza w ochronie środowiska, UAM, Poznań, 2004

3. L. Czarnecki, T. Broniewski, O. Henning, Chemia w budownictwie, Wyd. Arkady, W-wa, 1996

4. Praca zbiorowa, Ochrona elektrochemiczna przed korozją, WNT, W-wa, 1991

Breakdown of average student's workload

	Hours	ECTS
Total workload	150	6,0
Classes requiring direct contact with the teacher	80	3,5
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation)[1]	70	2,5

[1] delete or add other activities as appropriate