



COURSE DESCRIPTION CARD - SYLLABUS

Course name

General chemistry

Course

Field of study

Environmental 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

Other (e.g. online)

Tutorials

30

Projects/seminars

Number of credit points

5

Lecturers

Responsible for the course/lecturer:

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Responsible for the course/lecturer:

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Prerequisites

1. Knowledge:

The knowledge of chemistry at the high school basic level

2. Skills:

The solving of equations and systems of algebraic equations, the formulation of the chemical problems in mathematics languages, solve the simple differential and logarithmic equations

3. Social competencies:



The awareness of the need to constantly update and supplement knowledge and skills.

Course objective

The aim of the education in the context of this course is to strengthen and broaden the students knowledge of the basic areas of chemistry necessary for further study environmental engineering. The students will have knowledge of the structures and properties of chemical compounds and chemical reactions. They will learn about the factors affecting their reactivity. The students will be write based on literature about the problems in the basic chemistry.

Course-related learning outcomes

Knowledge

1. The student knows the basic concepts and laws of chemistry, has knowledge of chemistry and other areas useful for formulating and solving simple tasks in the field of environmental engineering - [KIS_W01, K_W03,]

Skills

1. The student is able to obtain information on the chemical subjects from the literature, databases and other sources; can obtain information from literature, databases and other properly selected sources, also in English or another foreign language recognized as a language of international communication in the field of environmental engineering; - [KIS_U03, KIS_U05]

2. The student can clearly present and interpret the results obtained and draw conclusions - [KIS_U03, KIS_U05]

3. The student is able to integrate the information obtained, interpret it, as well as draw conclusions and formulate and substantiate opinions; - [KIS_U03, KIS_U05]

Social competences

1. The student understands the need for teamwork in solving theoretical and practical problems; - [KIS_K01, KIS_K03,]

2. The student is aware of the responsibility for making decisions - [KIS_K03]

3. The student is aware of the non-technical aspects and effects of engineering activities, including its impact on the environment; - [KIS_K01]

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture

- 1-piece written final exam time of 45 minutes, the exam includes checking skills (2 tasks), and knowledge test (3 questions);

- In addition, continuous assessment for all classes (rewarding activity).



Classes

- 2 mini-written tests during the semester;
- Final written test;
- In addition, continuous assessment for all classes (rewarding activity).

The possibility of obtaining additional points for the activity in the classroom, especially for:

- reporting any confusion conducting
- propose other ways of solving problems;
- assistance in the improving teaching materials;
- identifying opportunities to improve the teaching process.

Grading Scale:

Scale of written evaluations:

50% - 60% sufficient

61% - 70% positive plus

71% - 80% good

81 - 90% good plus

91 - 100% very good

Programme content

The Lecture

Basic definitions and laws of chemistry. Elementary particles. Construction of atoms and molecules. Chemical elements. The periodic table of elements. The valence bond theory and the theory of molecular orbitals. The chemical bonds. Electronegativity and polarity. Intermolecular interaction. The chemical reactions and chemical equations. The rate of chemical reactions, the effect of concentration and temperature. Chemical equilibrium. Selected groups of organic compounds: hydrocarbons, alcohols, organic acids, amines, thiols, polymers (basic).

Classes



Calculations based on the chemical formula of the compound. molar and procentage concentration, mixing, dilution and increasing the concentration of the solutions.

Teaching methods

Information lecture, lecture with multimedia presentation, problem lecture; tutorials:accounting exercises

Bibliography

Basic

1. Szperliński Z., Chemia w ochronie i inżynierii środowiska, tomy 1-3, Oficyna Wydawnicza PW, W-wa 2002
2. Sienko M.J., Plane R.A., Chemia ? podstawy i zastosowania, WNT, W-wa, 1999.
3. Whittaker A.G., Mount A.R., Heal M.R., Krótkie wykłady, Chemia fizyczna, PWN S.A.,W-wa 2003.
4. Szperliński Z., Chemia w ochronie i inżynierii środowiska, tomy 1-3, Oficyna Wydawnicza PW, W-wa 2002

Additional

1. Cox P.A., Krótkie wykłady. Chemia nieorganiczna, PWN S.A.,W-wa 2003.
2. Cox P.A. Krótkie wykłady. Chemia organiczna, PWN S.A.,W-wa 2003
3. Dojlido J.R.: Chemia wód powierzchniowych, Wydawnictwo Ekonomia i Środowisko, Białystok, 1995
4. Lee J.D., Związła chemia nieorganiczna, PWN, W-wa, 1994.
5. Pauling L., Pauling P., Chemia, PWN, W-wa, 1997

Breakdown of average student's workload

	Hours	ECTS
Total workload	125	5,0
Classes requiring direct contact with the teacher	60	2,5
Student's own work (literature studies, preparation for tutorials, preparation for tests/exam) ¹	65	2,5

¹ delete or add other activities as appropriate