COURSE DESCRIPTION CARD - SYLLABUS

Course name
General chemistry [S1IŚrod1>CHO]

Course

Field of study
Environmental 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
30

Laboratory classes
0

Other (e.g. online)
0

Tutorials
30

Projects/seminars
0

Number of credit points

4,00

Coordinators

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Lecturers

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Prerequisites

1. Knowledge: Knowledge of chemistry at the high school basic level. 2. Skills: 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: 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.Student knows the basic concepts and laws of chemistry.
2. Has knowledge of chemistry and other areas useful for formulating and solving simple tasks in the field of environmental engineering.

Skills:
1. Student is able to obtain information on chemical topics from literature, databases and other properly selected sources.
2. Is able to formulate and solve engineering tasks in the field of environmental engineering to see their systemic and non-technical aspects and the need to apply the principles of sustainable development.

Social competences:
1. Student understands the need for teamwork in solving theoretical and practical problems.
2. Is aware of the responsibility for making decisions.
3. Is aware of the non-technical aspects and effects of engineering activities, including its impact on the environment.

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).
Grading Scale. Scale of written evaluations:
50% - 60% sufficient
61% - 70% positive plus
71% - 80% good
81 - 90% good plus
91 - 100% very good
Auditorium exercises:
2 mini-written tests during the semester. Final written test.
Grading Scale. Scale of written evaluations:
50% - 60% sufficient
61% - 70% positive plus
71% - 80% good
81 - 90% good plus
91 - 100% very good
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.

Programme content

Lecture:
1. Basic definitions and laws of chemistry.
2. Elementary particles.
3. Construction of atoms and molecules.
4. Chemical elements. The periodic table of elements. The valence bond theory and the theory of molecular orbitals. The chemical bonds.
5. Electronegativity and polarity. Intermolecular interaction.
6. The chemical reactions and chemical equations. The rate of chemical reactions, the effect of concentration and temperature. Chemical equilibrium.
7. Selected groups of organic compounds: hydrocarbons, alcohols, organic acids, amines, thiols, polymers (basic).
Auditorium exercises:
1. Calculations based on the chemical formula of the compound.

2. 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.
Auditorium exercises: problem method, solving tasks.

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.

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

Breakdown of average student's workload

	Hours	ECTS
Total workload	100	4,00
Classes requiring direct contact with the teacher	60	2,50
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	40	1,50