Level: bachelor

Course title: General Chemistry

Status: obligatory

ECTS: 9

Requirements: none

Learning objectives

Basic knowledge in the field of contemporary chemical terms, principles and theories.
To enable students to apply the standard methodology in solving simple problems and typical tasks in chemistry.
To develop practical skills necessary for safe work in the chemical laboratory.
To provide basic knowledge and skills necessary for the future study of chemistry.

Learning outcomes

After completing this course, the student is able to:
1. apply chemical terminology and nomenclature on the basic types of inorganic compounds;
2. demonstrate knowledge and comprehension of basic terms, principles and theories in the field of chemistry;
3. analyse and solve simple chemical tasks using knowledge of basic chemical concepts;
4. work safely with chemicals and basic laboratory apparatus and equipment;
5. formulate accurate conclusions based on experimental results.

Syllabus

Theoretical instruction

Subject of chemical study and its place in the system of natural and applied sciences. Basic stoichiometric laws. Chemical reactions and energetics of chemical reactions. States of matter. Atom structure. Basics of the quantum-mechanical model of the atom. Quantum numbers. Atomic orbitals. Periodic table of elements. Periodic table and the electronic configuration of atoms. Periodical properties of the elements. Chemical bond. Valence and oxidation number. Ionic bond and properties of ionic compounds. Covalent bond. The quantum-mechanical theory of covalent bond. Properties of covalent compounds. Hybridization of atomic orbitals. The geometry of the molecules. Intermolecular attractive forces. Metallic bond. Chemical kinetics and factors affecting the rate of chemical reactions. Chemical equilibrium. Solutions. Theories of acids and bases. Chemical equilibria in homogeneous and heterogeneous systems. Complex compounds. Bond theories in the complexes.

Practical instruction

Basic laboratory equipment and operations. Properties of elements, compounds and mixtures. Redox reactions. Solutions. Kinetics of chemical reactions. Chemical equilibria in homogeneous and heterogeneous systems. Complex compounds. Students master the basics of chemical calculation along with performing the exercises.

Weekly teaching load				Other:
Lectures: 3	Exercises: 3	Other forms of teaching: 2	Student research:	