

## General chemistry (I<sup>st</sup> Year of study, I<sup>st</sup> Semester)

Credit value (ECTS) 5

### Course category

Domain (Imposed)

### Course holder:

Lecturer Ph.D. Alina Elena TROFIN

### Discipline objectives (course and practical works)

The course is aimed at acquiring basic knowledge of general chemistry, the study of chemical elements and combinations, and the properties and importance of the main types of chemical systems found in living organisms and soil or directly related to them.

Practical work is aimed at acquiring lab techniques on general operations carried out in chemical analysis and interpretation of results.

### Contents (syllabus)

Course (chapters/subchapters)
<b>Introduction:</b> atom, substance, chemical formulas and reactions
<b>Chemical bonds:</b> ionic, covalent, coordinative, metallic, specific and non-specific intermolecular bonds
<b>Chemical reaction:</b> electron transfer and proton transfer reactions
<b>Homogeneous disperse systems:</b> properties, solubility, methods for separation and purification, principles, solution concentrations
<b>Elements and combinations:</b> characterization of the elements in the periodic table groups
<b>Chemical thermodynamics:</b> characteristic values, principles of thermodynamics
<b>Chemical kinetics:</b> reaction rate, chemical equilibria in homogeneous and heterogeneous systems
<b>Colloidal systems:</b> classification, methods of obtaining and purification, properties

Practical works
Processing work safety and firefighting rules in chemistry lab. Introduction to analytical chemistry
The concentrations of the solutions
Volumetric neutralization reactions. Determination of a sodium hydroxide solution concentration
Volumetric neutralization reactions. Determination of a sulfuric acid solution concentration
Volumetric neutralization reactions. Determination of an acetic acid solution concentration
Volumetric oxidation-reduction reactions: permanganometry

Volumetric oxidation-reduction reactions. Determination of $\text{Fe}^{+2}$ ion in the compounds. Identification of the ions $\text{Fe}^{+2}$ , $\text{Fe}^{+3}$
Volumetric oxidation-reduction reactions: iodometry. Determination of the concentration of a solution of sodium thiosulfate
Volumetric oxidation-reduction reactions: iodometry. Determination of the concentration of a solution of iodine
Volumetric oxidation-reduction reactions. Determination of a solution of sulphite ( $\text{SO}_3^{2-}$ )
Complexometry. Determination of water hardness.
Volumetric precipitation reactions. The dosage of chlorine ions by Mohr's method.
Volumetric precipitation reactions. The dosage of chlorine ion by Volhard's method.
Verification test

### Bibliography

1. Afusoaie Iulia, Trofin Alina - Chimie, curs, Editura USAMV, Iași, 2001
2. Constantinescu C. - Chimie anorganică și analitică, Ed. Did. Ped. Buc., 1982
3. Nenișescu D.C. - Chimie generală, Ed. Did. Ped. Buc., 1980
4. Trofin Alina – Chimie anorganică, Ed. USAMV, Iasi, 2005
5. Trofin Alina – Chimie fizică și coloidală, curs, Ed. PIM, Iasi, 2011
6. Afusoaie Iulia, Maria Savu, Antoanela Patraș - Chimie lucrări practice, C.M., 1996
7. Trofin Alina, Ungureanu Elena – Chimie anorganică și analitică, Editura PIM, Iași, 2011

### Evaluation

Evaluation form	Evaluation Methods	Percentage of the final grade
Exam	Oral / written examination	60%
Appreciation of the activity during the semester	Oral assessment during the semester, verification tests and final laboratory test.	40%

### Contact

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