

Subject: CHEMISTRY, Agricultural Biotechnologies, 1st year, 1st semester

Credit value (ECTS): 5

Course category: mandatory

Course holder: Trofin Alina Elena

Discipline objectives (course and practical works)

The course is aimed at acquiring the fundamental notions of general chemistry and the ability to apply them in understanding the specialized disciplines • acquiring knowledge regarding the study of chemical elements and combinations, as well as the properties and importance of the main types of chemical systems encountered in living organisms or in direct relation with 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)
1. Introductory notions: matter, body, substance, atom, formulas and chemical reactions
2. Chemical bonds
2.1. Ionic bond (electrovalence)
2.2. Covalent (covalence) and coordinative bond
2.3. Metallic bond
2.4. Specific and nonspecific intermolecular bonds
3. Chemical reaction
3.1. Electron transfer reactions
3.2. Proton transfer reactions
4. Homogeneous dispersed systems
4.1. Dissolution
4.2. Concentrations of solutions
5. Elements and combinations
5.1. Distribution of elements
5.2. Types of combinations
5.3. Characterization of the elements of the periodic system groups
6. Chemical thermodynamics
6.1. Thermodynamic principles
6.2. The laws of thermochemistry
7. Chemical kinetics
7.1. Reaction speed
7.2. Chemical equilibria in homogeneous and heterogeneous systems
8. Heterogeneous dispersed systems
8.1. Classification
8.2. Methods of preparation
8.3. Characteristic properties
8.4. Methods of purification

Practical works	
Processing work safety and fire preventing rules in laboratory. 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 Fe ⁺² ion in the compounds. Identification of the ions Fe ⁺² , 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 (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. Nenițescu D.C. - *Chimie generală*, Ed. Did. Ped. Buc., 1980
2. Trofin A. – *Chimie generală*, Ed. StudIS, Iasi, 2018
3. Trofin A., Ungureanu E. – *Chimie anorganica si analitica*, Ed. PIM, 2011
4. Trofin A., Ungureanu E. – *Aplicații de chimie generală, lucrări practice*, Editura PIM, Iași, 2013

Evaluation

Evaluation form	Evaluation Methods	Percentage of the final grade
Course	Exam	60 %
	presence	10 %
Practical works	Tests (theory and practice)	30 %

Contact

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