Study program: Pharmacy

Type and level of studies: Integrated academic studies, Level 1/2

Course unit: Analytical chemistry

Teacher in charge: Dr Marija Živković, assistant professor

Language of instruction: English

ECTS: 8

Prerequisites: -

Semester*:* Winter semester

Course unit objective: Acquiring knowledge and skills of General chemistry and laboratory practice.

Learning outcomes of Course unit:

Knowledge about:

- the fundamentals of analytical chemistry and steps of a characteristic analysis, demonstrate and compare qualitative and quantitative analyses methods;
- identification of ions or compounds in a sample;
- defining the different volumetric and gravimetric methods, solving volumetric and gravimetric calculations;
- determination of the detection limits, evaluation, and interpretation of the analytical data, determination of the sources of random errors.

Course unit contents

Theoretical classes

Introduction to analytical chemistry and its significance. Theoretical fundamentals of chemical methods of analysis. Solutions (concentrations and activity). Chemical equilibrium. Acid-base reactions. Complexation reactions. Deposition reactions. Redox reactions. Qualitative chemical analysis – analysis of cations and anions. Quantitative chemical analysis. Volumetric methods of analysis. Calculations in volumetry. Acidimetry and alkalimetry. Complexometry. Precipitation titrations. Oxidimetry and reductometry. Application of redox titration. Gravimetric methods of analysis.

Practical classes

Introduction to experimental work. Preparation of a specific concentration solution. Calculations tasks. Identification reactions of cations of the first and second analytical groups. Identification reactions of cations of the third, fourth and fifth analytical groups. Identification reactions of anions. Preparation of standard solutions. Calculations in volumetry. Acid-base titrations. Complexometry titrations. Precipitation titrations. Redox titrations. Some examples of gravimetric determinations. Calculations in gravimetry.

Literature

- Savić J., Savić M. Fundamentals of analytical chemistry, Institute for textbooks and teaching aids Sarajevo
- Mihajlović R., Vukadinović B., Mihajlović Lj. Qualitative chemical analysis, Faculaty of Science, University of Kragujevac, 2005.
- Mihajlović R. Quantitative chemical analysis, Faculaty of Science, University of Kragujevac, 2009.

Number of active teaching hours				**Other classes**
Lectures: 30	Practice: 15	Other forms of classes:	Independent work:	

Teaching methods: Lectures, laboratory practice

Examination methods (maximum 100 points)

Exam prerequisites	**No. of points:**	**Final exam**	**No. of points:**
Student's activity during lectures	**20**	oral examination	
practical classes/tests	**40**	written examination	**40**
Seminars/homework		.....	
Project			
Other			

Course unit description

Grading system		
Grade	**No. of points**	**Description**
10	**91-100**	Excellent
9	**81 – 90**	Exceptionally good
8	**71 – 80**	Very good
7	**61 – 70**	Good
6	**51 – 60**	Passing
5	< 51	Failing

(Table 5.2) Course unit description