



ФАРМАЦЕВТИЧЕН ФАКУЛТЕТ МЕДИЦИНСКИ УНИВЕРСИТЕТ - СОФИЯ

ул. Дунав №2, 1000 София; Тел./Факс: 0299879 874; e-mail: dean@pharmfac.mu-sofia.bg

Approved from the Faculty council with protocol: № 2/09.08.2023

DEAN:

(prof. Al. Zlatkov, DSci)

DEPARTMENT OF CHEMISTRY

SYLLABUS of Analytical Chemistry

INCLUDED IN “PHARMACY” EDUCATION CURRICULUM

DEGREE OF EDUCATION: “MASTER”

CREDITS (ECTS): 15

ANNOTATION

In the context of pharmaceutical sciences, analytical chemistry is a branch of science that provides knowledge about the separation, identification, and quantification of chemical compounds. An understanding of the principles of analytical chemistry is fundamental to performing correct analytical measurements, such as qualitative and quantitative determinations of compounds in pharmaceutical formulations, or biological fluids.

The objective of the Analytical Chemistry course is to familiarize students with the basic principles and methods of Chemical Analysis. In a theoretical aspect, an approach based on the principles of chemical equilibrium, the law of mass action and the equilibrium constant, is used. The course begins with fundamental analytical procedures such as volumetric analysis, involving titrimetry, and then continues with more advanced instrumental techniques, involving separations by chromatographic techniques, such as high performance liquid chromatography and gas chromatography, as well as spectral methods, such as spectrophotometry, potentiometry and mass spectrometry.

The so-called concentration-logarithmic diagrams with titration curves are widely used in the course, which represent a graphical approach for tracking concentration dependences in the course of chemical interaction. The course examines the fundamentals of volumetric analysis and instrumental methods in a general aspect.

The following sections are taught in the course: acid-base analysis in water and non-aqueous solvents, precipitation analysis, complexometry, redoximetry, potentiometry, separation methods and instrumental methods.

The laboratory work aims to give students practical experience and basic skills in laboratory practice and the most widely applied methods of analysis. Because accuracy in analytical measurements is critical, great attention is paid to the methods used for sample processing, statistical analysis of data collected, and reporting of results.

Type of control and evaluation: routine control – 3 (three) colloquiums, test on calculative tasks, development of an individual task, and a practical exam; academic year exam – written and oral.

English language training

SYLLABUS

1. Introduction to Analytical Chemistry. Qualitative and quantitative analysis.
2. Chemical equilibria and equilibrium constants.
3. Acid-base equilibrium.
4. Quantitative chemical analysis. Sample preparation.
5. Acid-base equilibria in aqueous and non-aqueous media.
6. Acid-base titrimetric analysis.
7. Equilibria in sparingly soluble compounds.
8. Precipitation titrimetric analysis.
9. Complex-forming equilibria.
10. Complexometric titrimetric analysis.
11. Oxidation and reduction.
12. Oxidation-reduction titrimetric analysis.
13. Instrumental methods of analysis. Classification.
14. Electrochemical methods of analysis.
15. Potentiometric methods of analysis.
16. Spectral methods of analysis.
17. Atomic and molecular spectral methods.
18. Separations in analytical chemistry.
19. Extractions and chromatographic methods.
20. Processing of the analysis results.

Date:.....

Program author:

(Assoc. Prof. V. Maslarska)

Head of the Department of Chemistry:

(prof. I. Doytchinova, DSc)