

Посветени на хуманността

МЕДИЦИНСКИ УНИВЕРСИТЕТ – ПЛОВДИВ

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## PROGRAMME IN ANALYTICAL CHEMISTRY COURSE, I year, II semester, 2025/2026

Chapters	Hours
<b>Chapter 1.</b> The nature of Analytical Chemistry. The role of analytical chemistry in modern science. Key terms. Classification of analytical techniques. Analytical process – steps.	2
<b>Chapter 2.</b> Units, Concentration and Stoichiometry. Some important units of measurement. Solutions and their concentration. Chemical stoichiometry. Significant figures.	3
<b>Chapter 3.</b> Errors, Random Errors and Statistical Data in Chemical Analyses.	3
<b>Chapter 4.</b> Chemical equilibrium. The law of mass actions. Equilibrium constants. Activity. Ionic strength. Equilibrium constants. Important equilibria in analytical chemistry.	2
<b>Chapter 5.</b> The chemical composition of aqueous solutions. Acid-base equilibrium. Brønsted-Lowry theory. Acid and base ionization constants. Water autoionization constant; pH and pOH. pH calculations using acid/base dissociation constants. Acid-base properties of salt solutions. Buffer solutions.	6
<b>Chapter 6.</b> Volumetric methods of analysis – definitions, classification, calculations and application. Advantages and disadvantages of volumetric analysis.	3
<b>Chapter 7.</b> Principles of neutralization titrations in aqueous solutions – solutions and indicators; titrations based on acid–base reactions (strong acid/strong base, strong base/strong acid, weak acid/strong base, weak base/strong acid, polyprotic acids). Application. Advantages and disadvantages.	5
<b>Chapter 8.</b> Acid-base equilibrium in non-aqueous media. Classification of solvents. Strengths of acids and bases. Levelling and differentiating effects. Titrations based on acid–base reactions in non-aqueous solvents. Selecting and evaluating the end point. Characterization. Application. Advantages and disadvantages.	2
<b>Chapter 9.</b> Precipitation equilibrium. Basic terms. Solubility and solubility product constant. Factors affecting solubility. Importance of solubility equilibrium.	2
<b>Chapter 10.</b> Precipitation titrations – principle. Argentometry – standard solutions, titration curves, end point detection, methods of titration. Application. Advantages and disadvantages.	2

February 03, 2026

Lecturer:

/Assoc.Prof. Z. Velkova, PhD/

Head of Department:

/Prof. K. Gavazov, PhD/