

**Thematic plan of seminar-type classes
in discipline « Applied chemistry in dentistry»
for students of 2025 year of admission
under the educational programme
31.05.03, Dentistry
specialisation (profile) Dentistry
(Specialist's degree),
form of study - full-time for the 2025-2026 academic year**

№	Thematic block	Hours (academic) ³
2 semester		
1.	Safety regulations and work rules in a chemical laboratory. General characteristics of polymers. Classification of polymers. Methods for obtaining polymers. ¹ Laboratory workshop "Polymer production methods".	4
2	Properties of solutions of high-molecular compounds. ¹ Swelling and dissolution of the HMC. Thermodynamics of polymer swelling and dissolution. Viscosity, types of viscosity. The Staudinger equation. Osmotic pressure, Donnan membrane equilibrium. The Haller equation. ² Laboratory workshop "Determination of the molecular weight of polyvinyl alcohol by the viscometric method".	4
3	Features of polymer chemistry in dentistry. ¹ Acrylic acid, esters of acrylic and methacrylic acids, products of their polymerization, widely used in dental practice. ² Ingredients of polymer materials. ¹ Laboratory workshop "Peculiarities of polymer chemistry. Ingredients of polymer materials".	4
4	Physico-chemical properties of biopolymers. ¹ Peptides and proteins: the role of hydroxyproline in stabilizing the collagen spiral of dentin and enamel; calcium-binding proteins of dentin and enamel. Heteropolysaccharides: the effect of mucopolysaccharides on the stabilization of the collagen structure of dentin and enamel. Lipids: the effect of lipids on dentin mineralization. ²	
5	Control of knowledge, skills, and abilities in modular units 1,2,3 ¹ (intermediate control)	4
6	Colloidal-dispersed systems. ¹ Dispersed phase and dispersion medium. Classification of dispersed systems and the structure of colloidal particles. Micelle. Physico-chemical bases of obtaining colloidal solutions. ² Laboratory workshop "Methods of obtaining and purifying colloidal solutions".	4
7	Methods of cleaning the HMC. ¹ Purification of proteins from low molecular weight impurities by dialysis. ² Laboratory workshop "Cleaning the HMC by dialysis".	4
8	Methods of separation and identification of the HMC. ¹ Chromatographic method of analysis, the essence of the method, its application, advantages. Types of chromatography. Radial chromatography of amino acids. ² Laboratory workshop "Radial chromatography of amino acids".	4
9	Polymer materials in therapeutic dentistry. ¹ The chemical basis of dextrans and their based sephadexes. Theoretical foundations of obtaining silicic acid gel. ² Laboratory workshop "Production of silicic acid gel".	4
10	Control of knowledge, skills, and abilities in modular units 4 ¹ (intermediate control)	4
11	Filling materials. ¹ Types and composition of sealing materials. Characteristics	4

	and application in dentistry. ²	
12	Dental cements. ¹ The composition and purpose of dental cements. Advantages and disadvantages. ² Laboratory workshop "Dental cements".	4
13	Characteristics and properties of dental impression materials. ¹ Classification of impression materials. Advantages and disadvantages. ² Laboratory workshop "Detection of mannuronic acid".	4
14	Elastic base plastics (acrylic, polyvinyl chloride, silicone, fluoro-rubbers) and their properties. ¹ Abstract conference. Part 1.	4
15	Dental adhesives. ¹ Classification of adhesive compounds in dentistry. Mechanisms of formation of adhesive joints. Dental sealants, their classification and application as preventive agents. ²	4
16	Biopolymers used for the prevention and treatment of oral diseases. ¹ Antimicrobial and antiviral drugs. ² Laboratory workshop "Detection of protein in interferon, iodine in yox, starch hydrolysis products in propolis".	4
17	Preventive toothpastes. ¹ Components of dental cleaning products. Preventive products used to whiten tooth enamel. ² Abstract Conference. Part 2.	4
18	Control of knowledge, skills and abilities by modular units 5,6 ¹	4
	Total	72

¹ – topic

² – essential content

³ – one thematic block includes several classes, the duration of one class is 45 minutes, with a break between classes of at least 5 minutes

Considered at the department meeting of Chemistry, protocol of «30» May 2025 № 10.

Head of the Department of Chemistry



A.K. Brel