

Biological and General Chemistry Department

THEMATIC PLAN OF LECTURES

FROM MEDICAL AND BIOORGANIC CHEMISTRY for I-st Year Foreign Students of the Medical Faculty 2016-2017 year

<i>Nº</i>	<i>Theme of lectures</i>	<i>Hours</i>
1	Formation of complexes in biological systems. Theoretical principle of Chelation Therapy.	2
2	Acid-base equilibrium in biological systems.	2
3	Colligative properties, biological liquids.	2
4	Theoretical principles of bioenergetics.	2
5	Kinetic laws of biochemical processes.	2
6	Electrode processes, biological role and medicine use.	2
7	Surface chemistry. Surface effects. Principles of adsorption therapy. Chromatography. Micro-heterogeneous disperse systems.	2
8	Colloidal solutions. Coarse-dispersion systems.	2
9	Physico-chemical properties of biopolymers.	2
10	Basics of the reactivity of biologically active compounds.	2
11	Reactionary ability of hydrocarbons and their derivatives	2
12	Carbonyl compounds. Lipids.	2
13	Amino acids, peptides, proteins chemical properties, biological role.	2
14	Carbohydrates: classification, structure, chemical properties, application in medicine.	2

Biological and General Chemistry Department

THEMATIC PLAN OF PRACTICAL LESSONS FROM MEDICAL AND BIOLOGICAL CHEMISTRY

for I-st Year Foreign Students of the Medical Faculty 2016-2017 year.

	<i>№</i>	<i>Theme of the practical lessons</i>	<i>Hours</i>
M1	1	Introduction. Safety in chemical laboratory. Periodical system by D.I. Mendeleev. Electronic structure of elements and ions. Control test of initial knowledge.	2
	2	Biogenic s - elements: chemical properties, biological role, uses in medicine.	2
	3	Biogenic p - elements: chemical properties, biological role, uses in medicine.	2
	4	Biogenic d - elements: chemical properties, biological role, uses in medicine.	2
	5	Formation of complexes in biological systems.	2
M2	6	Methods of expressing concentration of solution. Preparing solution.	2
	7	Acid-base equilibrium in the organism.	2
	8	pH scale of biological liquids.	2
	9	Neutralization method. Alkalimetry.	2
	10	Acidimetry.	2
	11	Buffer systems: classification, mechanism of the action.	2
	12	Buffer capacity. The Role of Buffers in Biological Systems.	2
M3	13	Colligative properties of solutions. Osmosis.	2
	14	Thermal effects of the chemical direction of the processes.	2
	15	Kinetics of biochemical reactions.	2
	16	Chemical equilibrium. Solubility equilibrium.	2
	17	Potentiometric method of analysis.	2
M4	18	Determination of oxidation-reduction (redox) potential.	2
	19	Sorbtion of biological active compounds on the layer liquid - gas.	2
	20	Sorbtion of biological active compounds on the layer solid compound – solution.	2
	21	Ion exchange. Chromatography.	2
	22	Physico-chemistry of disperse system.	2
	23	Preparation, purification and properties of colloidal solutions.	2
	24	Coagulation of colloidal solutions.	2
	25	Properties of biopolymers. Isoelectric point of proteins.	2
26	Differential test from medical chemistry	2	
Biological and Bioorganic Chemistry Module 1			
<i>Content module 1</i>			
M5	27	Nomenclature, isomerization, electronic structure of chemical bonds.	2
	28	Reactivity of alkanes, alkenes, arenes, alcohols, phenols.	2
	29	Reactivity of aldehydes and ketons.	2
	30	(oxyacids, oxoacids, phenolic acids).	2

	31	HFA. Lipids. Phosphoglyceride.	2
		<i>Content module 2</i>	
M6	32	Structure and chemical properties of α -amino acids.	2
	33	Structure and physical-chemical properties of proteins.	2
		<i>Content module 3</i>	
M7	34	Monosaccharides, structure and chemical properties. Oligo- and Polysaccharides, structure and chemical properties.	2
		<i>Content module 4</i>	
M8	35	Heterocyclic compounds, classification, structure and chemical properties. Nucleic acids: structure, classification and application in medicine.	2
	36	Practical skills: "Theoretical essential principles of structure and reactivity of bioorganic compounds". Module (biologically important classes of organic compounds, biopolymers).	2