

Khanty-Mansiysk Autonomous Okrug-Ugra
"Surgut State University"

Approved by
Deputy Rector for Academic Affairs

_____E.V. Konovalova

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Chemistry

Syllabus

Department	Chemistry
Curriculum	s310501-ЛечДело-Ин-23-1.plx Specialty 31.05.01 General Medicine
Qualification	General Practitioner
Form of education	Full-time
Total (in credits)	3
Total academic hours	108
including:	
Classes	64
Self-study	8
Hours for control	36

Control:
Exam, 2nd term

Course outline in terms

Academic year (Term)	2 (1.2)		Total	
	Cur	Syl		
Weeks	17 2/6			
Types of classes	Cur	Syl	Cur	Syl
Lectures	16	16	16	16
Laboratory	16	16	16	16
Practical	32	32	32	32
Total clas.	64	64	64	64
Contact	64	64	64	64
Self-study	8	8	8	8
Control hours	36	36	36	36
Total	108	108	108	108

1. COURSE OBJECTIVES						
1.1	The objectives of studying the discipline are: to study theoretical basis and principles of modern chemistry; to study main classes of chemical compounds and their properties; to study physical and chemical points of bio- and medical processes, role of biogenic elements and essential compounds in human systems; to form the idea of main biochemical reactions.					
2. COURSE OVERVIEW						
Course code (in curriculum):		Б1.О.01				
2.1	Assumed background: For the study of Chemistry, the student must know: the high school level chemistry, biology and natural sciences.					
2.2	Prerequisite courses and practice:					
2.2.1	Biochemistry					
2.2.2	Microbiology, Virusology					
2.2.3	Pharmacology					
3. COMPETENCES UPON COMPLETION OF THE COURSE (MODULE)						
GPC -5.3: Knows and understands the chemistry of bioorganic compounds, their participation in metabolism						
GPC -5.4: Knows the classification and structure of biochemical compounds, mechanisms of biochemical processes in the body, understands their importance in maintaining homeostasis, metabolism and pathogenesis of human diseases.N						
By the end of the course students must:						
know:						
physico-chemical nature of the processes occurring in a living organism at the molecular, cellular, tissue and organ levels						
be able to:						
use chemical equipment;						
make calculations according to the results of the experiment;						
conduct elementary static processing of experimental data.						
have skills of:						
self study work with educational, scientific and reference literature;						
safe working skills in a chemical laboratory and the skills to handle chemical glassware and reagents						
4. STRUCTURE AND CONTENTS OF THE COURSE (MODULE)						
Class Code	Topics /Class type	Term / Academic year	Academic hours	Competences	Literature	Notes
	Section 1. Basics of chemical thermodynamics and bioenergy. Laws of thermodynamics.					
1.1	Lecture /Lec/	2	2	GPC -5.3 GPC -5.4	L1.2 L3.1	
1.2	Laboratory /Lab/	2	2	GPC -5.3 GPC -5.4	L1.2 L3.1	
1.3	Practical work /Pr/	2	4	GPC -5.3 GPC -5.4	L1.2 L3.1	
1.4	Self-study /Self-study/	2	1	GPC -5.3 GPC -5.4	L1.2 L3.1	

	Section 2. Solutions. Protolytic reactions. Buffer solutions. Colligative properties of solutions.					
2.1	Lecture /Lec/	2	2	GPC -5.3 GPC -5.4	L1.2 L3.1	
2.2	Laboratory /Lab/	2	2	GPC -5.3 GPC -5.4	L1.2 L3.1	
2.3	Practical work / Pr /	2	4	GPC -5.3 GPC -5.4	L1.2 L3.1	
2.4	Self-study /Self-study/	2	1	GPC -5.3 GPC -5.4	L1.2 L3.1	
	Section 3. Chemical kinetics and catalysis. Chemical equilibrium. Basics of Electrochemistry.					
3.1	Lecture /Lec/	2	2	GPC -5.3 GPC -5.4	L1.2 L3.1	
3.2	Laboratory /Lab/	2	2	GPC -5.3 GPC -5.4	L1.2 L3.1	
3.3	Practical work / Pr /	2	4	GPC -5.3 GPC -5.4	L1.2 L3.1	
3.4	Self-study /Self-study/	2	1	GPC -5.3 GPC -5.4	L1.2 L3.1	
	Section 4. Physical chemistry of dispersed systems.					
4.1	Lecture /Lec/	2	2	GPC -5.3 GPC -5.4	L1.2 L3.1	
4.2	Laboratory /Lab/	2	2	GPC -5.3 GPC -5.4 7	L1.2 L3.1	
4.3	Practical work / Pr /	2	4	GPC -5.3 GPC -5.4	L1.2 L3.1	
4.4	Self-study /Self-study/	2	1	GPC -5.3 GPC -5.4	L1.2 L3.1	
	Section 5. Chemistry of biogenic elements. Complex compounds.					
5.1	Lecture /Lec/	2	2	GPC -5.3 GPC -5.4	L1.2 L3.1	
5.2	Laboratory /Lab/	2	2	GPC -5.3 GPC -5.4	L1.2 L3.1	

5.3	Practical work / Pr /	2	4	GPC -5.3 GPC -5.4	L1.2 L3.1	
5.4	Self-study /Self-study/	2	1	GPC -5.3 GPC -5.4	L1.2 L3.1	
	Section 6. Organic compounds. Mutual influence of atoms and reaction mechanisms. Stereochemistry.					
6.1	Lecture /Lec/	2	1	GPC -5.3 GPC -5.4	L1.1 L1.2 L2.1	
6.2	Laboratory /Lab/	2	1	GPC -5.3 GPC -5.4	L1.1 L1.2 L2.1	
6.3	Practical work / Pr /	2	2	GPC -5.3 GPC -5.4	L1.1 L1.2 L2.1	
6.4	Self-study /Self-study/	2	0,5	GPC -5.3 GPC -5.4	L1.2 L3.1	
	Section 7. Structure, biomedical properties of poly-and heterofunctional compounds. Chemistry of biologically active heterocyclic compounds. Alkaloids.					
7.1	Lecture /Lec/	2	1	GPC -5.3 GPC -5.4	L1.1 L1.2 L2.1	
7.2	Laboratory /Lab/	2	1	GPC -5.3 GPC -5.4	L1.1 L1.2 L2.1	
7.3	Practical work / Pr /	2	2	GPC -5.3 GPC -5.4	L1.1 L1.2 L2.1	
7.4	Self-study /Self-study/	2	0,5	GPC -5.3 GPC -5.4	L1.2 L3.1	
	Section 8. Amino acids, peptides and proteins.					
8.1	Lecture /Lec/	2	1	GPC -5.3 GPC -5.4	L1.1 L1.2 L2.1	
8.2	Laboratory /Lab/	2	1	GPC -5.3 GPC -5.4	L1.1 L1.2 L2.1	
8.3	Practical work / Pr /	2	2	GPC -5.3 GPC -5.4	L1.1 L1.2 L2.1	
8.4	Self-study /Self-study/	2	0,5	GPC -5.3 GPC -5.4	L1.2 L3.1	
	Section 9. Carbohydrates: mono-, oligo- and polysaccharides.					

9.1	Lecture /Lec/	2	1	GPC -5.3 GPC -5.4	L1.1 L1.2 L2.1	
9.2	Laboratory /Lab/	2	1	GPC -5.3 GPC -5.4	L1.1 L1.2 L2.1	
9.3	Practical work / Pr /	2	2	GPC -5.3 GPC -5.4	L1.1 L1.2 L2.1	
9.4	Self-study /Self-study/	2	0,5	GPC -5.3 GPC -5.4	L1.2 L3.1	
Section 10. Nucleic acids. Lipids.						
10.1	Lecture /Lec/	2	1	GPC -5.3 GPC -5.4	L1.1 L1.2 L2.1	
10.2	Laboratory /Lab/	2	1	GPC -5.3 GPC -5.4	L1.1 L1.2 L2.1	
10.3	Practical work / Pr /	2	2	GPC -5.3 GPC -5.4	L1.1 L1.2 L2.1	
10.4	Self-study /Self-study/	2	0,5	GPC -5.3 GPC -5.4	L1.2 L3.1	
Section 11. Steroids and terpenoids. Enzymes. Vitamins.						
11.1	Lecture /Lec/	2	1	GPC -5.3 GPC -5.4	L1.1 L1.2 L2.1	
11.2	Laboratory /Lab/	2	1	GPC -5.3 GPC -5.4	L1.1 L1.2 L2.1	
11.3	Practical work / Pr /	2	2	GPC -5.3 GPC -5.4	L1.1 L1.2 L2.1	
11.4	Self-study /Self-study/	2	0,5	GPC -5.3 GPC -5.4	L1.2 L3.1	
11.5	Control work / Contr. work./	2	4	GPC -5.3 GPC -5.4	L1.2 L3.1	Control work
11.6	/Exam/	2	32	GPC -5.3 GPC -5.4	L1.1 L1.2 L2.1 Э1 Э2	Exam

5. ASSESSMENT TOOLS

5.1. Assessment tools for midterm assessment

Presented by a single document

5.2. Assessment tools for diagnostic testing

Presented by a single document

6. COURSE (MODULE) RESOURCES

6.1. Recommended Literature

6.1.1. Core

	Authors	Title	Publish, year	Quantity
L1.1	Zurabyan, Sergej Eduardovic.	Fundamentals of Bioorganic Chemistry [Text] = Основы биоорганической химии : Textbook for Medical Students	[Moscow : GEOTAR-Media], 2017 .	31
L1.2	Bylikin, S. Yu.	[General and Bioorganic Chemistry] [Text] = Общая и биоорганическая химия : [Workbook for Foreign Students / S. Yu. Bylikin] .	[Moscow : Medical Infomational Agency], 2009 .	31

6.1.2. Supplementary

	Authors	Title	Publish, year	Quantity
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L2.1	Zurabyan, S.E.	Fundamentals of bioorganic chemistry [Электронный ресурс] / Zurabyan S.E. <URL: http://www.studentlibrary.ru/book/ISBN9785970421406.html >	М. : ГЭОТАР-Медиа, 2012.	-
6.1.3. Methodical development				
	Authors	Title	Publish, year	Quantity
L3.1	Krainik V. V., Denisova S. A., Prokhorenko L. G., Zhuravleva L. A.	General chemistry: an educational and methodical manual.	Surgut: Publishing Center of SurGU, 2013, electronic resource.	15
6.2. Internet sources				
Э1	ИБ СурГУ http://lib.surgu.ru/index.php?view=s&sid=30			
Э2	http://www.chem.msu.ru/			
6.3.1 Software				
6.3.1.1	Microsoft operating systems			
6.3.1.2	Microsoft Office Suite			
6.3.1.3	Programs for demonstration and creation of presentations "Microsoft PowerPoint"			
7. 7. MATERIAL AND TECHNICAL SUPPORT OF DISCIPLINE (MODULE)				
Classrooms for practical classes, group and individual consultations, monitoring and intermediate certification are equipped with: : typical classroom furniture, technical teaching aids, employees for the presentation of educational information.				