AL-FARABI KAZAKH NATIONAL UNIVERSITY
Faculty of Chemistry and Chemical Technology
Department of Chemistry and Technology of Organic Substances, Natural Compounds and Polymers

Approved
Dean of the Faculty
_____Ongarbaev E.K.
"_____"_____2017

SYLLABUS

fall semester, 2017-2018 academic year

Academic Information about the Course

Code of the discipline	The name of discipline	Type	No. of hours per week			Number of credits	ECTS
			Lecture	Practice	Laboratory work		
BH 3419	Bioorganic Chemistry	OK	1,5	0	3	4,5	7,5

Lecturer	Janar Jenis, Ph.D.	Office Hours	According to the timetable
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Assistant	Gadetskaya Anastassiya, Ph.D.	Office Hours	According to the timetable
e-mail	avg01.08@mail.ru		
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Academic presentation of the course	**Type of training course:** Intended to give insight into the specific and fundamental role of organic reactions occurring in nature, to provide students with a basic understanding of the chemical nature of biomolecules and biomacromolecules. The emphasis will be on the patterns of reactivity among natural products, rather than on the biochemical roles that these molecules play. **Goal of the course** is to gain familiarity with basic chemical principles, especially as they relate to biological systems.
Prerequisites	Organic Chemistry, Physical Chemistry, Catalysis
Postrequisites	Chemistry of Cyclic Compounds, Chemical Technology of Organic Substances
Informational resources	**Study literature:** 1. H. Stephen Stoker General, Organic, and Biological Chemistry 5th Edition. 2. Kenneth W. Raymond General, Organic, and Biological Chemistry: An Integrated Approach 2nd Edition. 3. H. Stephen Stoker Organic, and Biological Chemistry 2nd Edition. 4.David Van Vranken and Gregory Weiss Introduction to Bioorganic Chemistry and Chemical Biology 5. Donald Voet, Judith G. Voet Biochemistry, 4th Edition. 6. Ch. Pratt and K. Cornly, Essential Biochemistry, 3d edition.

	7. Fromm, Herbert J., Hargrove, Mark Essentials of Biochemistry, 2012th edition. **Internet resources:** 1. www.chem.qmul.ac.uk/iubmb 2. www.chemport.org 3. www.febs.org 4. www.molbiol.ru 5. www.ncbi.nlm.nih.gov/Genbank 6. www.swissprot.com 7. www.ncbi.nlm.nih.gov/PubMed 8. http://www.lipidlibrary.co.uk/lipids.html 9. http://www.genome.jp
Academic policy of the course in the context of university values	**Rules of academic behavior:** Plagiarism and other forms of cheating, cribbing and hints during the surrender of ISW, interim monitoring, as well as the final examination are prohibited. The student, caught on the falsifying of any information will receive a final grade «F». For the consultations on ISW, exams and other questions, please contact the teacher during office hours. **Academic values:** Be tolerant and respect the other people's opinion. Objection must be formulated in the correct form.
Evaluation and attestation policy	**Criterial evaluation:** Description of the work — Percentage — Completion time Laboratory work — 70% — 1 - 15 Assessment — 30% — 7, 14 Exam — 40% — 8,16 TOTAL — 100% **Summative estimation:** The final score will be calculated by the formula: Final grade = 0,3 (Short Exam 1 + Short Exam 2) + 0,1 Midterm Exam + 0,3 Final Exam Evaluation scheme in percentage: 95% - 100%: A — 90% - 94%: A- — 85% - 89%: B+ 80% - 84%: B — 75% - 79%: B- — 70% - 74%: C+ 65% - 69%: C — 60% - 64%: C- — 55% - 59%: D+ 50% - 54%: D- — 0% -49%: F

Calendar for the implementation of the training course content

Week/ date	Topic title (lecture, practical classes, ISW)	No. of hours	Maximum Score
1	2	3	5
1	Lecture 1. Introduction.	1	7
	Laboratory 1. Laboratory Safety.	2	
2	Lecture 2. Overview of bioorganic chemistry.	1	13
	Laboratory 2. Preparation of acetyl salicylic acid.	2	
	ISWT: Submission of the task 1 (Nomenclature of main biomolecules)		

3	Lecture 3. Lipids.	1	8
	Laboratory 3. Preparation of acetyl salicylic acid. Continued.	2	
4	Lecture 4. Lipids. Continued.	1	13
	Laboratory 4. Extraction of a known mixture.	2	
	ISWT: Submission of the task 2 (Difference in use of detergents based on)		
5	Lecture 5. Carbohydrate.	1	8
	Laboratory 5. Extraction of a known mixture. Continued.	2	
6	Lecture 6. Carbohydrate. Continued.	1	13
	Laboratory 6. Extraction of an unknown mixture.	2	
	ISWT: Submission of the task 3 (Functional groups in biological molecules)		
7	Lecture 7. Amino acids.	1	8
	Laboratory 7. Extraction of an unknown mixture. Continued.	2	
	Assessment (Short Exam 1)		30
8	Lecture 8. Peptides.	1	7
	Laboratory 8. Synthesis of acetanilide.	2	
9	Lecture 9. Proteins. Primary structure.	1	10
	Laboratory 9. Synthesis of acetanilide. Continued.	2	
	ISWT: Submission of the task 4 (Analysis of lidocaine)		
10	Lecture 10. Three-Dimensional Structure of Proteins. Protein Folding.	1	8
	Laboratory 10. Recrystallization of acetanilide.	2	
11	Lecture 11. Nucleic acids.	1	10
	Laboratory 11. Recrystallization of acetanilide. Continued.	2	
	ISWT: Submission of the task 5 (Molecular diseases)		
12	Lecture 12. Nucleic acids. Continued.	1	7
	Laboratory 12. The synthesis of soap.	2	
13	Lecture 13. Genomics and Proteomics	1	10
	Laboratory 13. The synthesis of soap. Continued.	2	
	ISWT: Submission of the task 6 (Cell structure and organization)		
14	Lecture 14. Enzymes.	1	8
	Laboratory 14. Essential oils of plants.	2	
	Assessment (Short Exam 2)		30
15	Lecture 15. Enzyme Mechanisms.	1	10
	Laboratory 15. Essential oils of plants. Continued.	2	
	ISWT: Submission of the task 7 (Protein Sequencing)		

Lecturer _____ Jenis J.

Head of the Department _____ Mun G.A.

Chairman of the Methodical Bureau of the Faculty _____ Ongarbaev E.K.