SYLLABUS
Fall semester 2026-2027 academic year
Educational program "6B05301 Chemistry"

ID and name of course	Independent work of the student (IWS)	Number of credits			General number of credits	Independent work of the student under the guidance of a teacher (IWST)
		Lectures (L)	Practical classes (PC)	Lab. classes (LC)		
91821 Organic chemistry I	240	30		60	6	12

ACADEMIC INFORMATION ABOUT THE COURSE

Learning Format	Cycle, component	Lecture types	Types of practical classes	Form and platform final control
Offline	B	Mix	Mix	Offline oral exam
Lecturer - (s)	**Dr. Bates Kudaibergenova Malikovna – PhD, act. professor**			
e-mail :	bateskudaibergenova1@gmail.com			
Phone :	87014765431			

ACADEMIC COURSE PRESENTATION

Purpose of the course	Expected Learning Outcomes (LO) *	Indicators of LO achievement (ID)
study of the main provisions of the theory of the structure of organic substances, the main classes of organic compounds, the dependence of the properties of organic compounds on their structure, laws and mechanisms of organic reactions.	**LO-1.** represent the structure of typical representatives of classes of organic compounds by name and call them by structural formulas based on knowledge of the principles of nomenclature and isomerism;	ID-1.1. write electronic structure and structural organic compounds ID-1.2. classifies organic compounds by structure ID-1.3. determination of the reactivity of organic compoundsspectrometers. ID-1.4. characterizes the chemical properties of organic compounds
	LO-2. predict the behavior of an organic compound under specific conditions based on its structure and knowledge of the typical reactivity of functional groups;	ID-2.1. write chemical reaction and the chain reatin of organic compounds. ID-2.2. determine the optimal conditions for the flow of the chain ID-2.3. defines the reaction mechanism for the chain in the question.
	LO-3. perform analysis of organic compounds	ID-3.1. use safe techniques when working with organic reagents and chemical devices; ID-3.2. purify organic compounds ID-3.3. determine the purity of the initial reagents ID-3.4. Determination of physical constants (boiling point, melting point, refractive index) of organic substances» ID-3.5. Methods of purification of organic compounds (sublimation, crystallization, extraction, fractional distillation)
	LO-4. conduct the synthesis of organic compounds	ID-4.1. instilling the chemical skills necessary for organic synthesis ID-4.2. synthesize an organic compound ID-4.3. isolate the raw product ID-4.4. purify the final product ID-4.5. identify the product
	LO-5. propose a scheme for obtaining a given organic substance	ID-5.1. They will conduct research, laboratory work ID-5.2. Receive experimental results ID-5.3. Perform a literary search on a given topic, substance ID-5.4. Summarize the experimental and literature data ID-5.5. Write the report from the getting knowledge.
Prerequisites	inorganic chemistry, analytical chemistry	
Postrequisites	Physico-chemical methods of organic substances, natural product chemistry	
Learning Resources	**Literature:** main, additional. Organic Chemistry. William H.Brown, 2008, 1230 p Wade, L. G., Organic chemistry / L.G. Wade, Jr. -- 8th ed.	

	Laurie S. Starkey. Introdution to strategies for Organic Synthesis. 2012, 360 p. Carmelo J. Rizzo. Advanced Organic Reactions, 2002, 194 p. Traven VF. Organic Chemistry. M. : "Akademkniga", 1.2 is 2004. Kudaibergenova B.M. "Organic Chemistry. Part I,II", 2019 **Internet resources** 1. http://elibrary.kaznu.kz/ru 2. http://www.a-levelchemistry.co.uk/

Academic course policy	**Rules of academic behavior:** Obligatory presence in the classroom, inadmissibility of late arrivals. Absence and delay in classes without prior warning of the teacher are estimated at 0 points. Mandatory compliance with the deadlines for the completion and delivery of assignments (on CDS, RC, control, laboratory, etc.), examinations. In case of violation of the deadlines, the task is evaluated taking into account the deduction of penalty points. **Academic values:** Academic honesty and integrity: independence of all tasks; inadmissibility of plagiarism, forgery, the use of cribs, cheating at all stages of knowledge control, deception of the teacher and disrespectful attitude towards him. (Codeks of Honor of a student of KazNU named after al-Farabi) Students with disabilities can receive counseling by e-mail: **Integration of science and education.** The research work of students, undergraduates and doctoral students is a deepening of the educational process. It is organized directly at the departments, laboratories, scientific and design departments of the university, in student scientific and technical associations. Independent work of students at all levels of education is aimed at developing research skills and competencies based on obtaining new knowledge using modern research and information technologies. A research university teacher integrates the results of scientific activities into the topics of lectures and seminars (practical) classes, laboratory classes and into the tasks of the IWST, IWS, which are reflected in the syllabus and are responsible for the relevance of the topics of training sessions and assignments. **Attendance.** The deadline for each task is indicated in the calendar (schedule) for the implementation of the content of the course. Failure to meet deadlines results in loss of points. **Academic honesty.** Practical/laboratory classes, IWS develop the student's independence, critical thinking, and creativity. Plagiarism, forgery, the use of cheat sheets, cheating at all stages of completing tasks are unacceptable. Compliance with academic honesty during the period of theoretical training and at exams, in addition to the main policies, is regulated by the "Rules for the final control" , "Instructions for the final control of the autumn / spring semester of the current academic year" , "Regulations on checking students' text documents for borrowings". Documents are available on the main page of IS Univer. **Basic principles of inclusive education.** The educational environment of the university is conceived as a safe place where there is always support and equal attitude from the teacher to all students and students to each other, regardless of gender, race / ethnicity, religious beliefs, socio-economic status, physical health of the student, etc. All people need the support and friendship of peers and fellow students. For all students, progress is more about what they can do than what they can't. Diversity enhances all aspects of life. All students, especially those with disabilities, can receive counseling assistance by phone / e- mail bateskudaibergenova1@gmail.com **ATTENTION!** The deadline for each task is indicated in the calendar (schedule) for the implementation of the content of the course, as well as in the MOOC. Failure to meet deadlines results in loss of points.

INFORMATION ABOUT TEACHING, LEARNING AND ASSESSMENT

Score-rating letter system of assessment of accounting for educational achievements				**Assessment Methods**
Grade	**Digital equivalent points**	**points, % content**	**Assessment according to the traditional system**	**Criteria-based assessment** is the process of correlating actual learning outcomes with expected learning outcomes based on clearly defined criteria. Based on formative and summative assessment. **Formative assessment is** a type of assessment that is carried out in the course of daily learning activities. It is the current measure of progress. Provides an operational relationship between the student and the teacher. It allows you to determine the capabilities of the student, identify difficulties, help achieve the best results, timely correct the educational process for the teacher. The performance of tasks, the activity of work in the classroom during lectures, seminars, practical exercises (discussions, quizzes, debates, round tables, laboratory work, etc.) are evaluated. Acquired knowledge and competencies are assessed. **Summative assessment** - type of assessment, which is carried out upon completion of the study of the section in accordance with the program of the course. Conducted 3-4 times per semester when
A	4.0 _	95-100	Great	
A-	3.67	90-94		
B+	3.33	85-89	Fine	

				performing IWS. This is the assessment of mastering the expected learning outcomes in relation to the descriptors. Allows you to determine and fix the level of mastering the course for a certain period. Learning outcomes are evaluated.	
B	3.0	80-84		**Formative and summative assessment**	**Points % content**
B-	2.67	75-79		Activity at lectures	6
C+	2.33	70-74		Work in practical classes	20
C	2.0	65-69	Satisfactorily	Independent work	14
C-	1.67	60-64		Laboratory work	20
D+	1.33	55-59	Unsatisfactory	Final control (exam)	40
D	1.0	50-54		TOTAL	100

Calendar (schedule) for the implementation of the content of the course. Methods of teaching and learning.

A week	Topic name	Number of hours	Max. ball
	MODULE 1		
1	**L.1.** Subject of organic chemistry. A brief history of the development of organic chemistry (radicals, unitary, theory of types, etc.). Butlerov's theory of construction.		
	Lab. 1. Safety rules in an Organic Laboratory. Laboratory utensils, equipment and installations.		
2	**L. 2**. Types of bonds in organic chemistry. Intermediate particles in Organic reactions. Homo and heterolithic bonds decay		
	Lab. 2. Methods for purifying organic compounds: recrystallization, determination of the melting point, refractive index, simple distillation.		
3	**L.3**. Reaction types: substitution (S_N, S_E, S_R), addition (A_E, A_N), elimination (E), rereagment.		
	Lab. 3. Methods for purifying organic compounds: recrystallization, determination of the melting point, refractive index, simple distillation.		
4	**L.4.** Trivial, rational and IUPAC nomenclatures of organic compounds		
	Lab.4. Preparation and properties of fatty hydrocarbons: alkanes, alkenes and alkynes.		30
	IWST 1. Consultations on the implementation of **IWS 1** Hybrid states of the carbon atom. Characteristic δ and π-bonds. Phenomenon isomerism.		
5	**L.5.** Types of hybridization. Asymmetric carbon atom. Chirality. Conformation, conformers.		
	Lab.5. Sublimation (dry distillation) of crystalline substances		8
	IWS 1. Work with IWS-1. Hybrid states of the carbon atom. Characteristic δ and π-bonds. Phenomenon isomerism.		10
	MODULE 2		
6	**L.6.** Alkanes: isomerism, nomenclature, extraction and chemical properties.		
	Lab.6. Chromatographic method of separation and identification of organic compounds. Types of chromatography		8
	IWST 2. Consultations on the implementation of **IWS 2** Compounds with two asymmetric carbon atoms. Their Fischer projection. Diastereomers and Meso-forms.		
7	**L. 7**. Alkenes: structure and isomeries, nomenclature, extraction		
	Lab.7. Methane extraction and its properties.		8
	IWS 2. Work under the SWS-2. Compounds with two asymmetric carbon atoms. Their Fischer projection. Diastereomers and Meso-forms.		10
	Control Work		
Midterm control 1			
8	**L. 8**. Alkenes: chemical properties. Electrophile coupling reaction mechanism and Harash effect.		
	Lab.8. Production of ethylene and its properties.		8
	IWST 3. Colloquium on the topic: Fundamentals of Organic Chemistry and Functional Groups		18
9	**L. 9**. Alkynes: isomerism, nomenclature, extraction and chemical properties.		
	Lab.9. Methods of synthesis, determination of alkynes, properties		
	IWST 3. Consultations on the implementation of **IWS 3.** Perspective and Newman projections of dichloroethane and dibromethane. Graphic representation of their conformations, nomenclature and torsion angles		
10	**L.10**. Alkadienes: double effect, extraction and chemical properties.		
	PW. Diene synthesis (Diels-Alder reaction) and its significance.		

	Lab.10. Methods for determining an unknown compound (Alkane, alkene, alkyne, halogen derivative, etc.).		8
	IWST 4. Work under the IWS-3. Perspective and Newman projections of dichloroethane and dibromethane. Graphic representation of their conformations, nomenclature and torsion angles Imaging electronic effects. Positive and negative electronic effect functional groups. Rules for assembling resonant structures.		10
	MODULE 3		
11	**L.11.** Alicyclic compounds: structure, extraction and chemical properties		
	Lab.11. Properties of Alicyclic compounds		
	IWST 5. Consultation on the implementation of IWS 4 Imaging electronic effects. Positive and negative electronic effect functional groups. Rules for assembling resonant structures.		10
12	**L. 12.** Aromaticity: Hückel's rule. Construction of benzene. Isomerism, nomenclature, extraction, properties and applications of aromatic compounds		
	Lab.12. Nitration of aromatic compounds		8
	Work with IWS-4. Imaging electronic effects. Positive and negative electronic effect functional groups. Rules for assembling resonant structures.		10
13	**L. 13.** Orientation rules in the benzene ring.		
	Lab.13. Sulfation of aromatic compounds		8
	IWST 6. Consultation on the implementation **of IWST 5.** Explanation of electrophilic substitution in the aromatic hydrocarbons using the resonance structure.		
14	**L.14.** The most important representatives of multi ring aromatic compounds.		
	Lab.14. Synthesis of acetylsalicylic acid (aspirin)		8
	Work with IWS-5. Explanation of electrophilic substitution in the aromatic hydrocarbons using the resonance structure.		10
15	**L.15.** Halogenated products: extraction, chemical properties		
	Lab.15. Preparation and Properties of Halogenated hydrocarbon		8
	IWST 7. Colloquium on the topic: Advanced Organic Chemistry and Drug-related Applications		14
Midterm control 2			**100**
Final control (exam)			**100**
TOTAL for course			**100**

Dean of the Faculty,
C.ch.sci., acc. prof., Dyusebaeva M.

Head of the Chair
C.ch.sci., prof., Irmuhametova G.S.

Chairman of the Academy of Sciences,
C.ch.sci., acc. prof., Bektemisova A.U.

Lecture, Dr., acc. Professor Kudaibergenova B.M