Identification	**Subject**	CHEM226, Organic Chemistry, 4 ECTS	
	Department	Chemistry and Chemical Engineering	
	Program	Undergraduate	
	Term	Fall 2025	
	Instructor	PhD Solmaz Aliyeva	
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	Phone		
	Classroom/hours	TBC	
	Office hours		
Prerequisites	Organic Chemistry		
Language	English		
Compulsory/Elective	Compulsory		
Required textbooks and course materials	[1] L. G. Wade, JR. Organic Chemistry, 8th edition, 2013 [2] John McMurry. Organic Chemistry (9th edition), 2016 [3] David R. Klein. Organic Chemistry, 4th Edition, 2021		
Website of course	Traditional face-to-face		
Teaching methods	**Lecture**	**X**	
	Group discussion	**X**	
	Practical tasks	**X**	

Evaluation	**Methods**	**Date/deadlines**	**Percentage (%)**
	Participation	Every week	5
	Activity	Every week	5
	Quiz	Weeks 5 and 12	10
	Midterm Exam	TBC	30
	Presentation/Group work	December	10
	Final Exam	TBC	40
	Total		100

Course outline	This course is designed for science majors, particularly chemistry majors. It covers the nomenclature, structure, properties, synthesis, and reactions of various organic compounds, including alkanes, cycloalkanes, alkenes, alkadienes, alkynes, aromatics, alcohols and phenols, aldehydes, ketones, carboxylic acids, and alkyl halides. The course also emphasizes stereochemistry. Key reaction types include radical halogenation, addition reactions to simple alkenes and conjugated dienes, Diels-Alder reactions, and aromatic substitution reactions. A strong emphasis is placed on understanding reaction mechanisms. Additional topics include structure-stability principles, resonance, conjugation, and aromaticity.
Course objectives	- Understand and apply key concepts of atomic structure, bonding, molecular geometry, hybridization, resonance, and aromaticity in organic chemistry; - Identify and predict the outcomes of organic reactions, analyzing their mechanisms to understand the step-by-step process of chemical transformations; - Recognize major organic functional groups and their reactions, and comprehend the principles of stereochemistry, including isomerism and chirality; - Gain comprehensive knowledge of naming organic compounds.
Learningoutcomes	By the end of this course, students will be able to: - Use IUPAC rules to name organic compounds accurately; - Evaluate the different conformations that organic molecules can assume; - Develop the ability to predict reaction mechanisms accurately. Comprehend the three primary types of organic reactions: substitution,

	elimination, and addition; - Understand various functional groups in terms of nomenclature, physical properties, reactions, and synthesis.
Policy	• **Participation** Students are expected to attend all classes, arrive on time, come prepared, and actively engage in discussions and group work. Participation is essential for learning and is a key part of the course. By contributing to class discussions and activities, students will deepen their understanding of the material and build critical thinking, communication, and teamwork skills that are valuable for academic and professional success. Students can receive a maximum of 5 (five) points for participation. • **Presentation/Group work** Students will engage in presentations and group projects to deepen their understanding of course concepts while developing teamwork and communication skills. These activities offer opportunities to demonstrate knowledge and collaborate effectively, fostering a dynamic and interactive learning environment. The presentation/group work is evaluated out of 10 (ten) points. • **Activity** Students should actively participate in classes, seminars, conferences, and relevant scientific events. Activity is evaluated with up to 5 (five) points. • **Quiz** There will be two quizzes throughout the semester to assess your understanding of the material covered. Each quiz will contain 5 (five) questions, with each question worth 1 (one) point. • **Withdrawal (pass/fail)** This course adheres to the grading criteria established by the School of Engineering and Applied Science. Typically, a minimum grade of 60% is required to pass. Students who do not meet this requirement will need to retake the course in the following term or year. • **Cheating/plagiarism** Cheating during exams, unauthorized use of materials in presentations, and plagiarism-presenting someone else's work as one's own without proper attribution-are strictly prohibited. Violations may result in a score of 0 (zero) without further consideration. • **Illness** If a student is unable to participate in a quiz or presentation due to illness, he or she must notify the instructor in advance and submit a doctor's note. After reviewing the situation, the instructor can set a new time for the quiz or presentation. A student is given only one chance. Students who do not notify the instructor in advance and do not provide a doctor's note will not be given a chance to retake the quiz or give a presentation. • **Professional behavior guidelines** Students are required to uphold a respectful academic and professional environment during class hours. Unauthorized conversations and unethical behavior are strictly prohibited. • **Classroom etiquette** Students are expected to arrive on time and be prepared for each session. Furthermore, to ensure a focused learning environment, mobile phones must be stowed and turned off during class time.

Tentative Schedule

Weeks	Topics	Reference books
1	Introduction to the study of organic chemistry Structure and properties of organic molecules	[1] p.1-36 [1] p.42-83
	Stereoisomers	[2] p.115-148
2	Alkanes: Structure; Natural sources; Physical Properties; Nomenclature; Constitutional Isomers; Uses; Reactions	[1] p.87-106 [2] p.60-88

		[3] p.138-162
3	Cycloalkanes: Physical Properties; Nomenclature; Cis-trans Isomerism in Cycloalkanes; Stabilities of Cycloalkanes; Substituted cycloalkanes; Polycyclic Systems	[1] p.107-128 [2] p.89-114 [3] p.164-179
	Problem-Solving Lesson (tasks, mini-quizzes, brief lab explainer)	
4	Alkenes: Structure and Bonding; Unsaturation; Nomenclature; Alkene Stability; Physical properties; Uses; Reactions; Synthesis	[1] p.285-382 [2] p.185-262
5	Quiz 1 (Covers weeks 1-4)	
	Alkadienes: Classification; Configurational Isomers; Nomenclature; Electrophilic Addition; Diels-Alder Reaction; Polymerization	[2] p.420-438
6	Alkynes: Structure and bonding; Uses; Nomenclature; Physical Properties; Alkyne acidity; Reactions	[1] p.392-419 [2] p.263-286 [3] p.417-446
7	Aromatic Compounds: Structure and physical properties of benzenes; Nomenclature; Stability of benzene; Annulenes; Aromatic, Antiaromatic, and Nonaromatic Compounds; Polycyclic Aromatic Compounds	[1] p.713-747 [2] p.451-477
	Reactions of Aromatic Compounds: Electrophilic aromatic substitution reaction mechanism; Halogenation; Nitration; Sulfonation; Friedel-Crafts alkylation and acylation; Nucleophilic Aromatic Substitution; Addition Reactions of Benzene Derivatives	[1] p.756-808 [2] p.478-524
8	**Midterm exam**	
9	Alcohols: Structure and Classification of Alcohols; Nomenclature; Physical Properties of Alcohols; Commercially important alcohols; Synthesis of Alcohols; Reactions Phenols: Structure, Properties, and Reactions	[2] p.525-567 [3] p.529-575
	Problem-Solving Lesson (tasks, mini-quizzes, brief lab explainer)	
10	Aldehydes: Structure, Nomenclature, Properties, and Reactions	[1] p.816-870 [2] p.604-648 [3] p.884-928
11	Ketones: Structure, Nomenclature, Properties, and Reactions	[1] p.816-870 [3] p.884-928
	Carboxylic Acids: Structure, Properties, and Reactions. Carboxylic acid derivatives: Esters; Amides; Nitriles; Acid halides; Acid anhydrides	[1] p.938-975 [3] p.938-946
12	Quiz 2 (Covers weeks 9-11)	
13	Amines: Structure, Properties, and Reactions	[1] p.879-930 [3] p.1054-1091
	Alkyl Halides: Common Uses, Structure, Physical Properties, Synthesis, Nomenclature of Alkyl Halides	[1] p.218-230 [2] p.287-308
14	Presentations	
15	Final exam preparation	
Final Exam		

The syllabus is a guide. Any changes will be announced in advance