

Identification	Subject	CHEM 111, Chemistry 1, 6 ECTS
	Department	Chemistry and Chemical Engineering
	Program	Undergraduate
	Term	Fall 2026
	Instructor	Tahir Javadzade
	E-mail:	tjavadzade@khazar.org
	Phone	
	Classroom/hours	TBC
	Office hours	Monday to Friday 09:30-17:30
Prerequisites		
Language	English	
Compulsory/ Elective	Compulsory	
Required textbooks and course materials	Main: - Chemistry: A Molecular Approach by Nivaldo J. Tro in pdf published in 2019 [1] Extra: - Chemistry: The Central Science" by Theodore L. Brown, H. Eugene LeMay Jr., Bruce E. pdf published in 2011 [2] - Chemistry: An Introduction to General, Organic, and Biological Chemistry by Karen C. Timberlake [3] - General Chemistry: Principles and Modern Applications" by Ralph H. Petrucci, William S. Harwood, and F. Geoffrey Herring [4] - Chemistry: An Introduction to General, Organic, and Biological Chemistry" by Karen C. Timberlake [5] - Chemistry: The Molecular Nature of Matter and Change" by Martin Silberberg and Patricia Amateis [6] - Chemical Principles: The Quest for Insight" by Peter Atkins, Loretta Jones, and Leroy Laverman [7] - Fundamentals of General, Organic, and Biological Chemistry" by John McMurry, David Ballantine, Carl Hoeger, and Virginia Peterson [8]	
Website of course	This course is based on traditional face-to-face classes.	
Teaching methods	Lecture	X
	Group discussion	X
	Practical tasks	X

Evaluation	Methods	Date/deadlines	Percentage (%)
	Activity		5
	Quiz	2 nd week of each month	15
	Midterm Exam	TBC	30
	Presentation/Group work	2 ^{nt} week of December	10
	Final Exam	TBC	40
	Total		100
Course outline	The course of Chemistry 1 covers fundamentals of chemistry. The goal of this course is to give students a solid foundation in the ideas and theories that support the study of matter and its changes, chemical nomenclature, atomic structure, chemical bonds, states of matter and etc. It is a key subject for anyone interested in the natural sciences or engineering since it gives students the knowledge and abilities they need to comprehend and manipulate matter.		
Course objectives	The objective of this course is to provide students with a broad and systematic understanding of the fundamental principles of chemistry and to develop their ability to apply chemical concepts to scientific and practical problems. The course introduces the essential body of chemical knowledge required to understand the composition, structure, properties, and transformations of matter. Students will become familiar with the scientific method and learn how observation, experimentation, data analysis, and logical reasoning are used to investigate chemical phenomena and draw scientifically supported conclusions. Particular emphasis will be placed on understanding and correctly writing chemical equations, recognizing different types of chemical reactions, and interpreting the quantitative relationships between reactants and products. Students will develop skills in stoichiometric calculations, including calculations involving moles, molar mass, reaction quantities, limiting reagents, and theoretical yields. The course also aims to establish a strong understanding of atomic and molecular structure, including the organization of atoms, electrons, and the basic principles governing molecular formation. Students will examine the nature of chemical bonding and learn to distinguish between ionic, covalent, and other types of interactions that determine the structure, stability, and properties of substances. In addition, students will study the different states of matter-solids, liquids, and gases-and explore how particle arrangement, intermolecular interactions, temperature, and pressure influence their physical properties and behavior. Overall, the course is designed to strengthen students' scientific thinking, quantitative problem-solving skills, and ability to connect fundamental chemical principles with real-world, laboratory, and technological applications.		

Learning outcomes	By the end of the course the students should be able: • To perform fundamental chemical calculations • To procure a fundamental knowledge in general chemistry. • To be ready to take advanced chemistry course
Policy	• Participation For a variety of reasons, participation in a classroom context is essential. It is essential to the learning process, promotes teamwork, and aids in the general success of both the individual students and the class as a whole. • Presentation/Group work Students frequently must explain difficult chemical ideas to their classmates when they work in groups or make presentations. As they must break it down into simpler terms and respond to inquiries from their classmates, teaching others can help students get a deeper knowledge of the content. • Activity The students should participate in the seminars, conferences, and other events related to their courses to build new connections between academic and non-academic institutions. This point will be based on student's activity on seminars. • Quiz A consistent method of gauging your understanding of the content covered in class is through quizzes. They assist you and your teacher in evaluating your comprehension of important ideas and identifying any areas that can benefit from more explanation. Each quiz will consist of 5 to 10 questions and each question will be marked according to its difficulty. There will be three quizzes. • Midterm and Final exams The Midterm and Final exams are conducted to assess students' knowledge by relating the topics that to be covered by the exam time and are evaluated with a total score of 30 (midterm) and 40 (final), respectively. • Withdrawal (pass/fail) The School Science and Engineering grading guidelines are carefully adhered to throughout this course. To pass, a student must typically receive a mark of at least 60%. If the student fails, the course. • Cheating/plagiarism Any form of plagiarism or cheating on a test, quiz, or project will result in the cancellation of the assignment. In this scenario, the student will receive a score of zero (zero) without any further consideration. • Illness Student with an illness may miss a quiz or presentation. This might be because the student needs to go to the hospital, recover at home, or attend regular medical appointments. In this case, the student must inform the instructor in advance about the illness and must present a document from their doctor. After considering the situation, the instructor may set a new date for the quiz or project presentation. Only one opportunity will be given to the student. The students who don't inform the instructor in advance will not be given a chance

	to retake the quiz or give a presentation. • Professional behavior guidelines During class hours, students are expected to conduct themselves in a way that fosters a positive academic and professional atmosphere. Discussions without permission and unethical conduct are absolutely forbidden. • Ethics In class, students must not be late. During class, mobile phones must be put away and turned off.
Use of Artificial Intelligence Tools	The use of Generative Artificial Intelligence (GAI) tools within this course is permitted solely for educational, research, and individual learning purposes and must remain consistent with the University's principles of academic integrity. GAI tools may be used as supplementary resources to support learning and research; however, all submitted work must reflect the student's own understanding, critical thinking, and academic contribution. Any use of GAI must be appropriately disclosed in the relevant assignment, project, presentation, or other academic material. Students are fully responsible for evaluating and verifying the accuracy, reliability, and appropriateness of all AI-generated content included in their work.

Tentative Schedule		
Weeks	Topics	Reference books
1	Introduction to Chemistry	[2] p. 2-31
2	Matter, measurement and Problem Solving	[1] p. 1-34
3	Atoms and Elements	[1] p. 49 - 79
4-5	Molecules and Compound	[1] p. 91-123
6	Chemical Reactions and Quantities	[1] p. 138 -158
7	Midterm exam	
8	Introduction to Solutions	[1] p. 166 -201
9	Gases	[1] p. 210 -250
10	Liquids, solids and intermolecular forces	[1] p. 494 -531
11	Chemical Bonding I	[1] p. 392 -427
12	Chemical Bonding II	[1] p. 436 -483
13	Solids	[1] p. 540 - 569
14	Solutions	[1] p. 578 - 619
15	Review	
Final Exam		