

<b>Identification</b>	<b>Subject</b>	CHEM 111 Chemistry-1, 6 ECTS		
	<b>Department</b>	Chemistry and Chemical Engineering		
	<b>Program</b>	Undergraduate		
	<b>Term</b>	Fall 2024		
	<b>Instructor</b>	Valida Fataliyeva		
	<b>E-mail:</b>	<a href="mailto:valida.fataliyeva@outlook.com">valida.fataliyeva@outlook.com</a>		
<b>Prerequisites</b>				
<b>Language</b>	English			
<b>Compulsory/Elective</b>	Compulsory			
<b>Required textbooks and course materials</b>	<p>Core textbooks</p> <ol style="list-style-type: none"> <li>General Chemistry (5th edition) , The Essential Concepts written by Raymond Chang and Kenneth A. Goldsby in pdf published in 2008</li> </ol> <p>Additional References</p> <ol style="list-style-type: none"> <li>Chemistry The Central Science 14th Edition</li> </ol> <p>For class presentations and discussions, the student should utilize journal and internet materials. Moreover, the course does not limit the use of learning materials available at Khazar University library.</p>			
<b>Website of course</b>	This course is based on traditional face-to-face classes			
<b>Teaching methods</b>	<b>Lecture</b>	X		
	<b>Group discussion</b>	X		
	<b>Practical tasks</b>	X		
	<b>Research from internet</b>	X		
	<b>Others</b>	X		
<b>Evaluation</b>	<b>Methods</b>	<b>Date/deadlines</b>	<b>Percentage (%)</b>	
	<b>Midterm exam</b>	Week 7	30	
	<b>Quizzes</b>	Week 5 and 12	10	
	<b>Presentation\Group work</b>	Week 15	15	
	<b>Participation</b>	Every week	5	
	<b>Final exam</b>		40	
	<b>Total</b>		100	
	<b>Description</b>	<p>In this course, we study chemistry, beginning with the basics of the atom and its behavior, then progressing to the chemical properties of matter and the chemical changes and reactions that take place all the time in our world. General Chemistry 1 covers the nature of matter, stoichiometry, basic chemical reactions, Gases, thermochemistry, atomic structure and the periodic table, and chemical bonding,</p>		

	<p>the properties of solutions. In this course, students will acquire fundamental knowledge such as the structure, nature, participation of substances in reactions, determination of precipitation in reactions, stoichiometric calculations and concentrations of solutions. This course will contribute to other courses in chemistry such as analytical, organic, petrochemical, physical chemistry, etc</p>
<b>Course objectives</b>	<p>Throughout this course, we will focus on the following learning objectives:</p> <p>Understand the fundamental concepts of chemistry.  Composition, structure and properties of substances.  The relationship between the structure of a molecule and its chemical properties.  Stoichiometric calculations in chemical reactions.</p> <p>Direction, types of chemical reactions and determination of precipitation in reactions.</p> <p>Properties of gases, determination of concentrations of solutions.</p>
<b>Learning outcomes</b>	<p>Here are some common learning outcomes associated with introductory chemistry courses:</p> <p>Distinguish between the physical and chemical properties of matter; Describe the arrangement of the periodic table;  Identify and write electron configurations;  Draw Lewis structures for molecules;  Name ionic and covalent compounds using the rules for nomenclature of inorganic compounds;  Perform stoichiometric calculations;  Use the Ideal Gas Law to calculate properties of gases;  Calculate enthalpy change for a given process, and explain the relationship between enthalpy change and the tendency for reactions to occur;  Classify solutions as acidic, basic, or neutral; determination of concentrations of solutions. Write and balance oxidation-reduction reactions.</p>
<b>Policy</b>	<ul style="list-style-type: none"> <li>▪ <b>Participation</b></li> </ul> <p>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. Students lose 0.17 marks for each lesson they miss.</p> <ul style="list-style-type: none"> <li>• <b>Quiz</b></li> </ul> <p>A consistent method of measuring 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.</p> <p>The quizzes could be thought of as "preparation" for the exams. Quizzes will be held twice during the semester and will give a total of 10 points. Each quiz will take place during class and consist of approximately 5 points conceptual multiple-choice, true/false, and short answer questions. You are allowed to use a calculator during quizzes, however books and notes are not permitted.</p> <ul style="list-style-type: none"> <li>• <b>Presentation\Group work</b></li> </ul> <p>Presentation\Group work consists of students researching a topic and presenting it in the form of a power point presentation. The maximum score for the presentation is 15 points.</p>

- **Midterm Exam**

Midterm exam is important components of the academic assessment process, and it serves several crucial purposes in a student's educational journey. Midterm is held in the middle of the semester and is evaluated with a total of 30 points. The time limit of midterm exam is 90 minutes. The format of the questions will vary, but expect a range of "easy", "medium" and "challenging" parts, with the point values for each question/part clearly labeled. During the exam, you are permitted to use a calculator (any model, provided that it has no communication ability; you also may not share calculators).

- **Withdrawal (pass/fail)**

The School of Engineering and Applied Science's grading guidelines are carefully adhered to throughout this course. In order to pass, a student must typically receive a mark of at least 60%.

- **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.

- **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 shouldn't be late. During class, all electronic devices must be put away and turned off.

		<b>Tentative Schedule (Can be changed)</b>	
<b>Weeks</b>	<b>Topic</b>	<b>Topics</b>	<b>Reference books</b>
1	1	<b>Introduction to Chemistry (1-12)</b> The Study of Chemistry (2) The Scientific Method (2) Classifications of Matter (4) Physical and Chemical Properties of Matter (7) Measurements (8) Accuracy and precision (17) Dimensional analysis in solving problems (18)	[1] Page 1-12
2	2	<b>Atoms, Molecules and Ions (28-52)</b> The Atomic Theory (29) The Structure of the Atom (30) Atomic Number, Mass Number, and Isotopes (35) The Periodic Table (36) Molecules, and Ions (38) Chemical Formulas (39) Naming Compounds (43) Introduction to Organic Compounds (51)	[1] Page 28-52
3	3	<b>Stoichiometry (58-84)</b> Atomic Mass (59) Avogadro's Number and the Molar Mass of an Element (61) Molecular Mass (64) Percent Composition of Compounds (67) Experimental Determination of Empirical Formulas (70) Chemical Reactions and Chemical Equations (73) Amounts of Reactants and Products (77) Reaction Yield (83)	[1] Page 58-84
4	4	<b>Reaction in Aqueous Solutions (94-114)</b> General Properties of Aqueous Solutions (95) Precipitation Reactions (97) Acid-Base Reactions (101) Oxidation-Reduction Reactions (106)	[1] Page 94-114
5		<b>Review and quiz</b>	

6	5	<b>Gases (132-152)</b> Substances That Exist as Gases (133) Pressure of a Gas (134) The Gas Laws (136) The Ideal Gas Equation (142) Dalton's Law of Partial Pressures (148)	[1]  Page 132-152
7	<b>Midterm wxam</b>		
8	6	<b>Energy Relationships in Chemical Reactions (171-195)</b> The Nature of Energy and Types of Energy (172) Energy Changes in Chemical Reactions (173) Introduction to Thermodynamics (174) Enthalpy of Chemical Reactions (180) Calorimetry (185) Standard Enthalpy of Formation and Reaction (191)	[1] Page 171-195
9	7	<b>The Electronic Structure of Atoms (206-233)</b> From Classical Physics to Quantum Theory (207) Quantum Mechanics (219) Quantum Numbers (221) Atomic Orbitals (222) Electron Configuration (226)	[1] Page 206-233
10	8	<b>The Periodic Table (245-271)</b> Periodic Classification of the Elements (246) Periodic Classification of the Elements (247) Periodic Variation in Physical Properties (250) Ionization Energy (256) Electron Affinity (259) Variation in Chemical Properties of the Representative Elements (261)	[1] Page 245-271
11	9	<b>Chemical Bonding I (279-304)</b> Lewis Dot Symbols (280) The Ionic Bond (281) Lattice Energy of Ionic Compounds (283) The Covalent Bond (285) Electronegativity (287) Writing Lewis Structures (291) The Concept of Resonance (296) Exceptions to the Octet Rule (298) Bond Enthalpy (302)	[1] Page 279-304
12		<b>Review and quiz</b>	

13	10	<b>The properties of solutions (425-446)</b> Types of Solutions (426) A Molecular View of the Solution Process (426) Concentration Units (429) Effect of Temperature on Solubility (432) Effect of Pressure on the Solubility of Gases (433) Colligative Properties (435)	[1] Page 425-446
14	11\12	<b>Introduction to Organic Chemistry (355-381)</b> Classes of Organic Compounds (356) Aliphatic Hydrocarbons (356) Aromatic Hydrocarbons (370) Chemistry of the functional groups (374) <b>Organic Polymers—Synthetic and Natural (739-754)</b> Properties of Polymers (740) Synthetic Organic Polymers (740) Proteins (744) Nucleic Acids (752)	[1] Page 355-381
15		<b>Presentations and Group works</b>	
		<b>Final exam</b>	