

Identification	Subject	CHEM111, General chemistry, 6 ECTS		
	Department	Chemistry and Chemical Engineering		
	Program	Undergraduate		
	Term	Fall 2025		
	Instructor	Gullu Aliyeva		
	E-mail:	gull.askar@mail.ru		
	Phone			
	Classroom/hours	Bakhikhanov		
	Office hours	Monday-Friday: 08:30-17:30		
Prerequisites				
Language	English			
Compulsory/Elective	Compulsory			
Required textbooks and Course materials	1. Petrucci, R. H., Herring, F. G., Madura, J. D., & Bissonnette, C. (2024). General chemistry: Principles and modern applications (12th ed.). Pearson. 2. Ebbing, Darrell D., et al. General Chemistry. 12th ed., Cengage Learning, 2024.			
Website of course	This course is based on traditional face-to-face classes.			
Teaching methods	Lecture	30		
	Groupdiscussion	30		
	Practicaltasks	X		
Evaluation	Methods	Date/deadlines	Percentage (%)	
	Activity		5	
	Quiz	TBC	15	
	Midterm Exam	TBC	30	

	Presentation/Group work	TBC	10
	Final Exam	TBC	40
	Total		100
Course outline	<p>The General Chemistry course aims to deepen the knowledge of chemistry acquired during secondary education and to establish a foundation for advanced chemistry courses at the university level.</p> <p>In the teaching of this subject, students study the fundamental concepts and laws of chemistry, classical and modern theories regarding the nature of solutions, the structure of the atom, the characterization of the energetic states of electrons in atoms through quantum numbers, and classical and modern theories concerning the nature of chemical bonding. The course also covers the types of chemical bonds, the mechanisms of covalent bond formation, hybridization of atomic orbitals, and the corresponding geometric structures of hybridized states.</p>		
Course objectives	<p>The objective is to provide students with knowledge of the theoretical foundations of chemistry, thereby establishing a solid basis for future specialized courses and facilitating their more effective and accessible understanding by students.</p>		
Learning outcomes	<p>Upon completion of the course, students should be able to:</p> <ul style="list-style-type: none"> • Demonstrate a comprehensive understanding of the fundamental concepts of chemistry; • Possess general knowledge of atomic structure and chemical bonding; • Understand the preparation methods of solutions and be able to calculate their concentrations; • Have a detailed understanding of the classification of chemical reactions. 		

Policy	<ul style="list-style-type: none">• Participation/Activeness Actively participating in class discussions, asking questions, and contributing to group activities can enhance your understanding of complex concepts. It allows you to clarify certain doubts, exchange ideas, and learn from both peers and the instructor.• Quiz A quiz is a form of assessment that helps instructors measure students' understanding of key concepts and topics. They are designed to assess whether students have grasped the material presented during lectures or practical sessions. Quizzes are conducted in written form. Open-ended questions are graded from 1 to 5 points depending on their level of difficulty. The quiz is evaluated out of a total of 15 points.• Presentation Students studying the subject of Inorganic Chemistry demonstrate their knowledge and skills on various topics through presentations. Engaging in group work and presentations during class helps students develop skills that can be directly transferred to their future careers. Students research a given topic and deliver a 10–15 minute presentation based on the information they have gathered. After the presentation, questions are asked on the topic. If both the presentation and responses to the questions are strong, the student is awarded the maximum score of 10 points.• Course Completion A student is considered to have completed the course if they score 60% or more. Otherwise, the student must retake the course.• Violations In cases of rule violations during midterm or final exams (such as attempts to cheat or other unlawful behavior), the student's exam will be invalidated.• Classroom Behavior Students must do everything possible to maintain an appropriate academic environment during class. Unauthorized talking, unnecessary movements, and other unethical behaviors are strictly prohibited. Students should participate actively in class, ask questions when needed, and not remain disengaged from discussions.	
Tentative Schedule		
Weeks	Topics	Reference books
1	Electron arrangement	[1] p.28-35

2	Ar and Mr. Relative atomic mass. The mole	[2] p.12-23
3	Mass spectrometry. Successive ionisation energy.	[1] p.37-45
5	Periodic table. Electronegativity	[1] p 10-17
6	Covalent bonding. Giant Covalent macromolecules. Metallic bonding. H-bonding.	[2] p.53-64
7	Midterm Exam	
8	Inter and intramolecular forces	[1] p.67-73
9	Amount of substance and quantitative analysis in gases and solutions	[2] p.41-52
10-11	Oxidation redox reactions	[2] p.68-78
12	The alkaline earth elements	[1] p. 89-100
13	The halogens	[1] p.355-368
14	Transition metals and coordination chemistry	[2] 259-287
15	Color and Paramagnetic of complex ions and coordination compounds	[2] 288-301
Final Exam		