Identification	**Subject (code, title, credits)**	CHEM 212 Analytical Chemistry and Instrumental Analysis , 6 ECTS	
	Department	Chemistry and Chemical Engineering	
	Program (undergraduate, graduate)	Undergraduate	
	Term	Fall 2023	
	Instructor	Ayaz Mammadov	
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Prerequisites	Chemistry 1 & 2		
Language	English		
Compulsory/Elective	Compulsory		
Required textbooks and course materials	Core textbooks 1. David Harvey, "Modern Analytical Chemistry" 2000 2. Stanley R. Crouch, F. James Holler, Douglas A. Skoog, "Principles of Instrumental Analysis" Seventh Edition, 2016 Additional References 3. F.W. Fifield, D. Kealey, "Principles and Practice of Analytical Chemistry" Fifth Edition, 2000 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.		
Course website	This course is based on traditional face-to-face classes		
Teaching methods	**Lecture**		**x**
	Group discussion		**x**
	Research from internet		**x**
	Others		**x**
Evaluation	**Methods**	**Date/deadlines**	**Percentage (%)**
	Midterm Exam	Week 7	30
	Quizzes	Week 5	10
	Presentation/Group work	Week 4-15	15
	Participation	Every week	5
	Final Exam		40
	Total		100
Course outline	In this course, the methods, technologies and analytical processes used in analytical chemistry are thoroughly explained. Students will learn analytical approaches such as sample collection, preparation and selection of appropriate equipment, sample analysis using classical and modern methods. In addition, they will learn in detail the principles, usage and application of modern analytical instruments.		
Course objectives	Throughout this course, we will focus on the following learning objectives: Understand the fundamental concepts of analytical chemistry Use of classical and modern methods in analysis and evaluating analytical data Solubility, acid/base chemistry, formation of precipitate, oxidation/reduction, hydrolysis, and equilibrium chemistry. Gravimetric and titrimetric methods of analysis Modern analytical instruments, their use and application		
Learning outcomes	By the end of the course the students should be able -To apply the basis methods of Analytical Chemistry. - Performing analysis using modern analytical devices - To perform problem solving strategies - Application of analysis methods to practice		

Policy	▪ **Participation** Actively participating in class discussions, asking questions, and contributing to group activities can enhance your understanding of complex concepts. It allows you to clarify doubts, exchange ideas, and learn from your peers and the instructor. Students lose 0.17 marks for each lesson they miss. ▪ **Quiz** Quizzes are a form of assessment that helps instructors gauge students' understanding of key concepts and topics. They provide a quick snapshot of whether students have grasped the material presented in lectures or readings. Students will have two quizzes (tests) during the course. They will get maximum 10 marks for quizzes. ▪ **Presentation/Group work** The field of analytical chemistry often involves collaborative projects and presentations in a professional setting. Engaging in group work and presentations during the class helps students develop skills that are directly transferable to their future careers. Students will present their work in the form of a presentation. ▪ **Withdrawal (pass/fail)** The School of Science and Engineering grading guidelines are carefully adhered to throughout this course. In order to pass, a student must typically receive a mark of at least 60%. If the student fails, the course must be retaken. ▪ **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.

Week	Topic	Topics	Textbook/Assignments
1	1	Basic Tools of Analytical Chemistry	[1] (11-29)
2	2	Evaluating Analytical Data	[1] (53-88)
3	3	Calibrations, Standardizations, and Blank Corrections	[1] (104-129)
4	4	Equilibrium Chemistry	[1] (135-170)
5	5	Gravimetric Methods of Analysis	[1] (232-265)
6	Review topics:		
7	**Midterm exam**		
8	6	Titrimetric Methods of Analysis	[1] (273-331)
9	7	An Introduction to Spectrometric Methods	[2] (120-143)
10	8	An Introduction to Ultraviolet-Visible Molecular Absorption Spectrometry, Applications of Ultraviolet-Visible Molecular Absorption Spectrometry	[2] (304-350)
11	9	Molecular Luminescence Spectrometry	[2] (361-384)
12	10	An Introduction to Infrared Spectrometry, Applications of Infrared Spectrometry	[2] (412-433)
13	11	Nuclear Magnetic Resonance Spectroscopy	[2] (453-493)
14	12	Molecular Mass Spectrometry	[2] (501-533)
15	**Review**		
	Final exam		

This syllabus is a guide for the course and any modifications to it will be announced in advance.