

Republic of Iraq
Ministry of higher education and
scientific research
University of Warith al-anbiyaa
Collage of pharmacy



جمهورية العراق
وزارة التعليم العالي والبحث العلمي
جامعة وارث الأنبياء عليه اسلام
كلية الصيدلة

Academic Course Description

Analytical Chemistry

Course Description Template

1-Course Title	
Analytical Chemistry	
2-Course Code	
AC112	
3- Semester / Academic Year	
First Semester 2025–2026	
4- Date of Preparation	
28/01/2026	
5- Attendance Mode	
In-person	
6- Credit Hours:	
Units: 4 Theoretical: 45 Practical: 30	
7- Course Coordinator:	
Name: Zainab Saad Abdulameer Email: zaineb.sa@uowa.edu.iq	
8- Course Objectives	
Course Learning Objectives	This course aims to provide students with a solid theoretical background in the fundamental chemical principles essential for practicing chemical analysis. It enables students to understand the importance of evaluating the accuracy and precision of experimental data and quantitative analytical techniques, and demonstrates that theory often serves as a useful guide for solving analytical problems.
9- Teaching and Learning Strategies	
Strategies	Teaching strategies include lectures, presentations, educational videos, discussion sessions, and laboratory experiments to achieve the intended learning outcomes.

10- Course Structure					
week	hours	topic	Intended Learning Outcomes	Learning methods	Assessment methods
1	4	Review of basic concepts in analytical chemistry	Analytical chemistry relies heavily on a sound understanding of several fundamental concepts, most notably the behavior of strong and weak electrolytes, as well as the correct use of units of mass and concentration, since these play a crucial role in the accuracy of calculations and the interpretation of results.	-Lectures -Presentation -Educational videos -Laboratory experiments	- Written exams - Oral exams - Quizzes / Daily tests - Laboratory reports
2-5	10	Evaluation of analytical data and gravimetric analysis	evaluation of analytical data: definition of terms. Introduction to gravimetric analysis, including statistical analysis of data, rejection of unacceptable data, precipitation methods, and the gravimetric factor.	-Lectures -Presentation -Educational videos -Laboratory experiments	- Written exams - Oral exams - Quizzes / Daily tests - Laboratory reports
6	4	Applications of gravimetric analysis	Inorganic precipitating agents and organic precipitating agents	-Lectures -Presentation -Educational videos -Laboratory experiments	- Written exams - Oral exams - Quizzes / Daily tests - Laboratory reports
7-8	5	Introduction to the volumetric analysis	This unit includes volumetric calculations, acid–base equilibria, and pH calculations.	-Lectures -Presentation -Educational videos -Laboratory experiments	- Written exams - Oral exams - Quizzes / Daily tests - Laboratory reports
9	3	Buffer solutions	Buffer solutions and neutralization titrations (simple systems)	-Lectures -Presentation -Educational videos -Laboratory	- Written exams - Oral exams - Quizzes / Daily tests - Laboratory

				experiments	reports
10-11	5	Neutralization titrations in complex systems & precipitation titrations	the theory of equilibrium titrations for complex systems deals with the fundamental principles governing equilibrium reactions in systems that involve more than one reaction or more than one chemical species. It also includes the study of precipitation titrations , which rely on the formation of a slightly soluble precipitate to accurately determine the concentration of substances	-Lectures -Presentation -Educational videos -Laboratory experiments	- Written exams - Oral exams - Quizzes / Daily tests - Laboratory reports
12	4	pH calculations in complex systems	This topic addresses methods for calculating the pH in complex systems, as well as the study of volumetric methods that rely on the reactions of complex systems in chemical analysis.	-Lectures -Presentation -Educational videos -Laboratory experiments	- Written exams - Oral exams - Quizzes / Daily tests - Laboratory reports
13-14	6	Oxidation–reduction equilibria and redox titrations	this topic involves the study of equilibria in oxidation-reduction systems , along with an explanation of the theoretical principles of redox titrations in chemical analysis	-Lectures -Presentation -Educational videos -Laboratory experiments	- Written exams - Oral exams - Quizzes / Daily tests - Laboratory reports
15	4	Spectrophotometric analysis	spectrophotometric analysis provides an introduction to optical	-Lectures -Presentation -Educational	- Written exams - Oral exams - Quizzes /

			methods in chemical analysis , with a focus on techniques that rely on radiation absorption to determine the concentrations of chemical substances	videos -Laboratory experiments	Daily tests - Laboratory reports
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11- Course Assessment

The total mark (100) is distributed among daily preparation, quizzes, oral examinations, monthly assessments, written examinations, laboratory reports, and other evaluation activities.

12- Teaching and Learning Resources

Required Textbook	Fundamentals of analytical chemistry by Skoog and West
Main references (sources)	As mentioned above
Recommended supporting books and references (scientific , reports)	As mentioned above
Electronic references , websites	Google, Scholar