

Course Description Form

1. Course Name:					
Analytical chemistry (Theoretical+ Practical)					
2. Course Code:					
Phpch25-111					
3. Semester / Year:					
First semester/2025-2026					
4. Description Preparation Date:					
15/1/2026					
5. Available Attendance Forms:					
Students' signature on attendance sheet					
6. Number of Credit Hours (Total) / Number of Units (Total)					
3 hours Theoretical + 2 hours Practical (75) /4 units					
7. Course administrator's name (mention all, if more than one name)					
Theoretical					
Name: Dr. Aws Maseer Nejres Email: aws.m.nejres@uomosul.edu.iq Name: Dr. wallada hameed Ibrahim Email: wallada.h@uomosul.edu.iq					
Practical					
Name: Nada Ahmed Email: nadaahmed199238@uomosul.edu.iq Name: Dr. wallada hameed ibrahem Email: wallada.h@uomosul.edu.iq					
8. Course Objectives					
Course Objectives			Preparing students and supporting them with information related to qualitative and quantitative chemical analyzes and studying the theories related to that.		
9. Teaching and Learning Strategies					
Strategy		Lecturing Seminars Homework Quiz Mid-term & final exams			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3+2	Introduction to Analytical Chemistry: Types and roles in drug development and QC	By the end of this course, students will be able to: Understand the fundamentals of classical and instrumental analytical techniques.	Theoretical lectures. Practical (Laboratory safety rules)	Paper-based exams

2	2+2	Review of Basic Concepts: Concentration units, standards, solution preparation	By the end of this course, students will be able to: Understand the fundamentals of classical and instrumental analytical techniques.	Theoretical lectures. Practical(Glass ware laboratory)	Paper-based exams
3	3+2	Gravimetric Analysis: Precipitation, weighing, error sources	By the end of this course, students will be able to: Understand the fundamentals of classical and instrumental analytical techniques.	Theoretical lectures. Practical(Prepare solutions from solids and liquids)	Paper-based exams
4	3+2	Volumetric Analysis I: Acid-base titrations, indicators, pH, calculations	Quantitative analysis	Theoretical lectures. Practical(Titration principles)	Paper-based exams
5	3+2	Volumetric Analysis II: Precipitation and Complexometric titrations (Mohr, EDTA)	Quantitative analysis	Theoretical lectures. Practical (Titration of HCl with sodium Carbonate)	Paper-based exams
6	2+2	The scope of applications of gravimetric analysis: Inorganic precipitating agents; organic precipitating agents	Quantitative analysis	Theoretical lectures. Practical (Titration of HCl with NaOH)	Paper-based exams
7Mid-term Exam					
8	2+2	An introduction to volumetric methods of analysis: Volumetric calculations; acid-base equilibria and pH calculations	Quantitative analysis	Theoretical lectures. Practical (Titration of KMnO ₄ with oxalate acid)	Paper-based exams
9	2+2	Introduction to Pharmacopoeias: USP, BP, monographs, specifications	Quantitative analysis	Theoretical lectures. Practical (Titration of KMnO ₄ with oxalate acid)	Paper-based exams
10	3+2	UV-Visible Spectrophotometry: Principles, Beer's Law, applications	Quantitative analysis	Theoretical lectures.	Paper-based exams

				Practical (unknown sample determination)	
11	3+2	Statistical Evaluation of Data: Mean, SD, confidence limits, Q-test, Grubbs test	Quantitative analysis	Theoretical lectures. Practical (Titration of $KMnO_4$ with ferrous sulfate)	Paper-based exams
12	3+2	Redox Titrations: Principles, iodometry, permanganometry	Quantitative analysis	Theoretical lectures. Practical (Determination of chloride by Mohr method)	Paper-based exams
13	3+2	Electrochemical Methods: Potentiometry, Conductometry	Quantitative analysis	Theoretical lectures. Practical (unknown sample determination)	Paper-based exams
14	3+2	Introduction to Chromatography: TLC, paper chromatography	Quantitative analysis	Theoretical lectures. Practical (Determination of water hardness)	Paper-based exams
15	Final Exam				

11. Course Evaluation

- 20 Marks... Theoretical assessment; (paper-based mid-term exam + quiz + attendance + seminars)
- 20 Marks... practical assessment (attendance + quiz + practice+unknown sample assessment)
- 60 Marks... paper-based theoretical final exam

Total 100 Marks

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	<ol style="list-style-type: none"> 1) Fundamentals of Analytical Chemistry – Skoog, West, Holler & Crouch 2) Pharmaceutical Analysis – A.H. Beckett & J.B. Stenlake 3) Quantitative Chemical Analysis – Daniel C. Harris 4) Supplementary: British Pharmacopoeia (BP), United States Pharmacopoeia (USP), ICH Q2(R1)
Main references (sources)	Modern Pharmaceutical Drug Analysis, by L. Zechmeister

	And L. Von.Cholnoky, ISBN (13): 978-81-224-2718-9
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	