



Course Description/ Faculty of Science

Department of:Chemistry.....

1. Instructor/ Coordinator (منسق المساق)

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Teaching Assistant (if any):	-----

2. Course Information

Level: Second	Course Title: Analytical chemistry Lab	Course No.: 40232
Class Time: 1.30-4.30	Prerequisite / Co-requisite: 403231	Course Type: Practical
Study Hours: 1	Semester: Second	Academic Year: 2022 /2023
Type of teaching: <input checked="" type="checkbox"/> Face to face <input type="checkbox"/> Blended (<input type="checkbox"/> 2:1 <input type="checkbox"/> 1:1 <input type="checkbox"/> 1:2) <input type="checkbox"/> Online		

3. Textbook(s)

Title	Fundamental of analytical chemistry
Author	Skoog/West/Holler/Crouch
Publisher	BROOKS/COLE CENGAGE learning
Year	2004
Edition	9th edition
Textbook Website	www.cengage.com

4. References (books and research published in periodicals or websites)

1-	Daniel C. Harris., Quantitative chemical analysis, 7th edition. W.H. Freeman and Company, England. 2005.
2-	Harvey, David. Modern Analytical Chemistry. McGraw Hill, New York .2000.

5. Course Description

Provide a practical introduction to the basic principles of analytical chemistry. Emphasis will be placed on sample preparation and quantitative and qualitative analysis of known and unknown samples, gravimetric analysis such as silver chloride gravimetry, and volumetric analysis: acid-base, complexometric, precipitation and redox titrations and separation technique ion exchange.

6. Course Outcomes (CO's)

Upon successful completion of the course, student will be able to: (Use Bloom's Taxonomy Verbs)

CO#		SO
1	list the basic types of equipment's in analytical laboratory, Deal with cleaning solutions, balances, volumetric glassware, chemical solutions included within the lab. Assess the accuracy of analytical volumetric glassware through carrying calibration of certain volumetric glassware.	
2	Learn how to make different type of titration (acid-base, redox, complexation, etc.) for quantitative determination of analyte concentration in known or unknown samples. Learn how to make gravimetric determination of analyte in unknown samples.	
3	Write clear, detailed, scientifically laboratory reports that explain the obtained data. Select an appropriate analytical method for solving the analytical problem.	
∴	prepare standard solution from primary standard material to conduct standardization of different solutions, analyze and interpret experimental data through statistical handling.	

7. Course Contents

Week #	Topic	Chapter
1	Experiment No. 1 Calibration of volumetric glassware	
2	Experiment No. 2 The gravimetric determination of chloride	
3	Experiment No. 3 The gravimetric determination of sulfate	
4	Experiment No. 4 The gravimetric determination of nickel	
5	Experiment No. 5	

	An introduction to acid-base titrations.	
6	Experiment No. 6 Determination of a carbonate mixture.	
7	Mid-Term Exam	
8	Experiment No. 7 Precipitation titrations (Argentometric titrations)	
9	Experiment No. 8 (Redox titration) Determination of the volume strength of hydrogen peroxide solution by using potassium permanganate.	
10	Experiment No. 9 (Redox titration) The determination of iron (III) in a given sample by titration with potassium dichromate solution.	
11	Experiment No. 10 (Complexometric titration) Determination of calcium and magnesium in water (water hardness)	
12	Experiment No. 11(Chromatography) Determination of calcium by ion exchange chromatography	

8. Teaching and learning Strategies and Evaluation Methods

	Evaluation /Measurement Method (Exam/ presentations/ discussion/ assignments)	Learning Activities	Teaching Strategies	Learning Outcomes
1.	Exams		Board Lectures	
2.	Reports		Home works - pre lab evaluation - Post lab evaluation - practicing experimentally	
3.				
4.				
5.				
6.				

9. Assessment

Distribution of grades	Assessment Time	Methods Used
30%	-----	Reports
20%	One hour	Paper exam
50%	Two hours	Paper exam

10. Program Educational Objectives (PEOs)

(To be added by the academic department)

1.				
2.				
3.				
4.				
5.				
6.				

11. Student Learning Outcomes for the Program. (SO's)

SO's (1-6)	Science Student Learning Outcomes for the Program
1	An ability to identify, formulate, and solve broadly defined technical or scientific problems by applying knowledge of mathematics and science and/or technical topics to areas relevant to the discipline.
2	An ability to formulate or design a system, process, procedure or program to meet desired needs.
3	An ability to develop and conduct experiments or test hypotheses, analyze and interpret data and use scientific judgment to draw conclusions.
4	An ability to communicate effectively with a range of audiences.
5	An ability to understand ethical and professional responsibilities and the impact of technical and/or scientific solutions in global, economic, environmental, and societal contexts.
6	An ability to function effectively on teams that establish goals, plan tasks, meet deadlines, and analyze risk and uncertainty.

11. Mapping between Student Outcomes and Program Educational Objectives

PEOs	SO1	SO2	SO3	SO4	SO5	SO6
PEO1	■		■			
PEO2						
PEO3			■			