Course Syllabus
Faculty of Arts and Science
Academic Department Chemistry
Academic Year 2021/2022 Semester: First

Course Title :	Analytical Chemistry lab
Course No. :	1722204
Prerequisite :	1722203 or concurrent
Concurrent :	……
Department :	Chemistry
Coordinator :	Dr. Waed Alahmad
Mode of Instruction	**On-Campus Learning** - 3 hours in-class (Synonym) learning

*** Instructor:**

Lecturer	Office Phone	Room No.	Office Hours	E-mail
Dr. Waed Alahmad	1414	*221*	8.00-9.30 SMTW	*W_alahmad@asu.edu.jo*

Course Description

Students will have hands on calibration and statistical analysis, titration methods, gravir analysis and separation science based on paper chromatography and ion-exc chromatography in addition to this, they will develop skills like being a team player th working in couples in some experiments in groups and technical writing skills through writing.

Intended Learning Outcomes

Upon the completion of the course, this module should lead to the following learning outcomes:

A. Knowledge and Understanding (Student should):

A1 Recognize the classical analytical techniques including volumetric and gravimetric in the analysis of sample.

A2 Describe the calculation, errors, and statistical data Treatment methods in analytical chemistry

B. Cognitive and Intellectual Skills (Student should):

B1 Calculate different problems to estimate the analyte concentration using volumetric and gravimetric analysis

B2 Analyze chemical data related to volumetric and gravimetric analysis

C. Subject Specific Skills (Student should):

C1 Collaborate effectively with other people in a team.

C2 Select appropriate traditional techniques for chemical analysis

D. Communication, Information Technology, Numerical:

D1 Interpret data derived from laboratory observations and measurements in terms of their significance and the theory underlying them.

D2 Perform analysis in the lab using different tools and different technique

Program Learning Outcomes (PLOs):

1.1	Describe the fundamentals of chemistry including structure, reactivity and properties of chemical substances, different situation of reaction and the states of matter.
1.2	Construct essential facts, principles and theories across the four principal areas of chemistry, i.e. analytical, organic, inorganic and physical.
1.3	Align major issues currently at the frontiers of chemical research and development.
2.1	Differentiate between the different states of the matter, elements and compounds based on the recognition and quantification of the properties
2.5	Solve the scientific problems using different mechanisms and procedures
3.1	Demonstrate adequate life-long learning skills
3.2	Collaborate effectively with other people in a team

3.3	Select appropriate techniques and procedures for chemical synthesis and analysis.
4.3	Interpret data derived from laboratory observations and measurements in terms of their significance and the theory underlying them.
4.4	Employ computational software's and data- processing skills in handling of chemical information and analysis of chemical data
5.1	Assemble and use properly chemistry experimental setups
5.2	Perform correctly quantitative measurements requiring accurate and precise manipulations

Course Learning Outcomes Alignment Matrix								
PLO	**A1**	**A2**	**B1**	**B2**	**C1**	**C2**	**D1**	**D2**
1.1	√	√						
1.2	√	√						
1.3	√	√						
2.1			√					
2.5				√				
3.1					√			
3.2					√			
3.3						√		
4.3							√	
4.4							√	
5.1								√
5.2								√

Course Contents and Schedule

Week	Day and Date	**Topics to be covered**	**Method of instruction**	**CLOs**	**PLOs**
1	Sun. 17th Oct.	Lab Instructions and safety	In-class lecture	**A1 A2**	**1.1 1.2 1.3**
2	Sun. 24th Oct.	A. Volumetric measurement glassware (Use of Pipette & Buret) B. Preparation of solutions (Molarity, ppm, (V/W) %)	In-class lecture	**B1,B2, C1,C2, D1,D2**	**2.1,2.5, 3.1,3.2, 3.3,4.3 ,4.4,5.1 ,5.2**

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3	Sun. 31st Oct.	Acid-base titration: Strong Base with Strong acid	In-class lecture	**B1,B2, C1,C2, D1,D2**	**2.1,2.5, 3.1,3.2, 3.3,4.3 ,4.4,5.1 ,5.2**
4	Sun. 7th Nov.	Determination of amount of Weak Acid	In-class lecture	**B1,B2, C1,C2, D1,D2**	**2.1,2.5, 3.1,3.2, 3.3,4.3 ,4.4,5.1 ,5.2**
5	Sun. 14th Nov.	Acid-base titration: Titration of a acid polyprotic	In-class lecture	**B1,B2, C1,C2, D1,D2**	**2.1,2.5, 3.1,3.2, 3.3,4.3 ,4.4,5.1 ,5.2**
6	Sun. 21st Nov.	Determination of Chloride Ion Concentration by Titration (Mohr's Method)	In-class lecture	**B1,B2, C1,C2, D1,D2**	**.1,2.5,3. ,3.2,3.3, .3,4.4,5. 1,5.2**
7	Sun. 28th Nov.	Midterm Lab. Exam	In-class lecture		
8.	**MID Term Exam**				
9	Sun. 12th Dec.	Determination of Chloride Ion Concentration by Titration (Volhard's Method)	In-class lecture	**B1,B2, C1,C2, D1,D2**	**2.1,2.5, 3.1,3.2, 3.3,4.3 ,4.4,5.1 ,5.2**
10	Sun. 19th Dec.	Standardization of potassium permanganate using oxalic acid (Part I)	In-class lecture	**B1,B2, C1,C2, D1,D2**	**2.1,2.5, 3.1,3.2, 3.3,4.3 ,4.4,5.1 ,5.2**
11	Sun. 26th Dec.	Determination of the Mass of Iron in a Ferrous Solution (Part II)	In-class lecture	**B1,B2, C1,C2, D1,D2**	**2.1,2.5, 3.1,3.2, 3.3,4.3 ,4.4,5.1 ,5.2**
12	Sun. 2nd Jan.	Estimation of total, permanent and temporary hardness of water (EDTA method)	In-class lecture	**B1,B2, C1,C2, D1,D2**	**2.1,2.5, 3.1,3.2, 3.3,4.3 ,4.4,5.1 ,5.2**
13	Sun. 9th Jan.	GRAVIMETRIC study of Sulfate in A SAMPLE.	In-class lecture	**B1,B2, C1,C2, D1,D2**	**2.1,2.5, 3.1,3.2, 3.3,4.3 ,4.4,5.1 ,5.2**
14	Sun. 16th Jan.	Gravimetric determination of Chlorides.	In-class lecture	**B1,B2, C1,C2, D1,D2**	**2.1,2.5, 3.1,3.2, 3.3,4.3 ,4.4,5.1 ,5.2**
15	Sun. 23rd Jan.	Final Lab. Exam	In-class lecture		
16.	**Final Exam**				

Grading Plan and Assessment Tools

Assessment Tools	Weights	Due date
Mid-term	30	TBA
Assignments	……	……
Quizzes	10	TBA
Inter active lectures	……	……
Group Work	……	……
Presentation	……	……
Reports	10	TBA
Project	……	……
Case-Study	……	……
Final Exam	50	TBA

Supplementary Reading

Textbook:

- LABORATORY MANUAL For Analytical Chemistry, 1722204
- Fundamentals of Analytical Chemistry, Jan 1, 2013 9th Edition by Douglas A. Skoog and Donald M. West , F. James Holler (Author), Stanley R. Crouch (Author), ISBN-10: 0495558281 | ISBN-13: 9780495558286

References:

- Analytical Chemistry: An Introduction, 8th ed. by D.A. Skoog, D. M. West, F. J. Holler and S.R. Crouch (2007). ISBN 0-03-020293-0.
- Analytical Chemistry, 7th Edition by Gary D. Christian, Purnendu K. Dasgupta, Kevin A. Schug, 2013- 2014, ISBN : 978-1-118-80516-9

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Subject Coordinator	**Dr. Waed Alahmad**	**Signature:**	----------
Head of Curriculum Committee	**Dr. Hussam Miqdad**	**Signature:**	----------
Department Head	**Dr. Hussam Miqdad**	**Signature:**	----------
Faculty Dean	**Dr. Hadeel Ali Saed**	**Signature:**	----------

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- Department Head.
- Head of Curriculum Committee.
- Course File.