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

Course Title :	Analytical chemistry
Course No. :	1722203
Prerequisite :
Concurrent :
Department :	Chemistry
Coordinator :	Dr. Waed Alahmad
Mode of Instruction	<u>On-Campus Learning</u> - 3 hours in-class (Synonym) learning

*** Instructor:**

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

Course Description

Analytical chemistry is an undergraduate course that covers the following analytical methods and concepts: The nature of analytical chemistry, errors in chemical analysis, chemical equilibria, and gravimetric method of analysis, titration methods and complexation titration.

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 Be able to understand the basic concepts of stoichiometry
- A2 Be able to understand the basic concepts of energy .
- A3 Be able to understand the basic concepts of chemical equilibrium

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A4 Understand concepts of atomic structure

B. Cognitive and Intellectual Skills (Student should):

B1 Distinguish energy applications needs and requirements

B2 Analyze and compare the different applications requirements

C. Subject Specific Skills (Student should):

C1 Implement solution of reactions rate

C2 Implement solution of thermo chemistry.

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
2.3	Analyze chemical and spectral data to identify and confirm chemical structures as well as determine chemical composition
2.5	Solve the scientific problems using different mechanisms and procedures
3.1	Demonstrate adequate life-long learning skills
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

Course Learning Outcomes Alignment Matrix

PLO	A1	A2	B1	B2	C1	C2
1.1	√					
1.2	√					
1.3					√	
2.1						



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2.3		√				
2.5			√			
3.1					√	
3.3				√		
4.3				√		√
4.4						√

Course Contents and Schedule

Week	Day and Date	Topics to be covered	Method of instruction	CLOs	PLOs
1	Sun. 17 th Oct.	Chemicals, Apparatus, and Unit Operations of Analytical Chemistry, Using Spreadsheets in Analytical Chemistry	In-class lecture	A1	1.1 1.2
	Tue. 19 th Oct.		In-class lecture		
2	Sun. 24 th Oct.	Calculations Used in Analytical Chemistry	In-class lecture	B1	2.5
	Tue. 26 th Oct.		In-class lecture		
3	Sun. 31 st Oct.	Errors in Chemical Analyses	In-class lecture	A2	2.3
	Tue. 2 nd Nov.		In-class lecture		
4	Sun. 7 th Nov.	Random Errors in Chemical Analysis	In-class lecture	A2	2.3
	Tue. 9 th Nov.		In-class lecture		
5	Sun. 14 th Nov.	Statistical Data Treatment and Evaluation Sampling, Standardization and Calibration	In-class lecture	B2	3.3
	Tue. 16 th Nov.		In-class lecture		
6	Sun. 21 st Nov.	Aqueous Solutions and Chemical Equilibria	In-class lecture	A1	1.1 1.2
	Tue. 23 rd Nov.		In-class lecture		
7	Sun. 28 th Nov.	Effect of Electrolytes on Chemical Equilibria	In-class lecture	A1	1.1 1.2
	Tue. 30 th Nov.		In-class lecture		
8.	MID Term Exam				
9	Sun. 12 th Dec.	Solving Equilibrium Problems for Complex Systems	In-class lecture	B1	2.5
	Tue. 14 th		Assignment		



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	Dec.				
10	Sun. 19 th Dec.	Gravimetric Methods of Analysis	In-class lecture	B2	4.3
	Tue. 21 st Dec.		Assignment		
11	Sun. 26 th Dec.	Titrimetric Methods; Precipitation Titrimetric	In-class lecture	B2	3.3
	Tue. 28 th Dec.		Assignment		
12	Sun. 2 nd Jan.	Principles of Neutralization Titrations	In-class lecture	C2	4.3
	Tue. 4 th Jan.		Assignment		
13	Sun. 9 th Jan.	Titration Curves for Complex Acid/Bases Systems	In-class lecture	C2	4.4
	Tue. 11 th Jan.		Assignment		
14	Sun. 16 th Jan.	Applications of Neutralization Titrations	In-class lecture	C1	1.3
	Tue. 18 th Jan.		Problem Solving		
15	Sun. 23 rd Jan.	Complexation Reactions and Titrations	Assignment	C1	3.1
	Tue. 25 th Jan		Problem Solving		
16.	Final Exam				

Grading Plan and Assessment Tools

Assessment Tools	Weights	Due date
Mid-term	30	TBA
Assignments	10	TBA
Quizzes	10	TBA
Inter active lectures	
Group Work	
Presentation	



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Reports	
Project	
Case-Study	
Final Exam	50	TBA

Supplementary Reading

Textbook:

- 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: -----

Copy to:

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

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رمز النموذج: UF 28 / 2

رقم القرار 24 / 233

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