



ASU
جامعة العلوم التطبيقية الخاصة
APPLIED SCIENCE PRIVATE UNIVERSITY

AMMAN - JORDAN



المستوى الذهبي

جامعة كل العرب

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

Course Title :	General Chemistry (1)
Course No. :	1722100
Prerequisite :
Concurrent :
Department :	Basic Science and humanities
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	10-12 SMTW	W_alahmad@asu.edu.jo
<u>Ahmad AbuRayyan</u>	1410	219	12-2 MTW	a_aburayyan@asu.edu.jo

Course Description

The course covers fundamentals of chemistry including states of matter, atomic structure, bonding and molecular structure, chemical reaction. Reaction stoichiometry, rate of chemical reactions, equilibria, thermodynamics and thermochemistry.

Amman – Jordan : عمان – الأردن : فاكس: 5232899 _ Tel: 5609999

رمز النموذج: UF 28 /2

رقم القرار 24 / 233

تاريخ الاعتماد 2021/10/18



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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
- 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.
1.4	Memorize certain knowledge in Arabic and English languages, computer science, Islamic religion
1.7	State certain subjects that are academically and/or professionally related to chemistry
2.1	Differentiate between the different states of the matter, elements and compounds based on the recognition and quantification of the properties
2.2	Explain concepts, principles and determine the efficiency of chemical systems by applying mathematical expressions
2.7	Calculate mathematically the output of different chemical reactions
3.1	Demonstrate adequate life-long learning skills
4.3	Interpret data derived from laboratory observations and measurements in terms of their significance and the theory underlying them.



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Course Learning Outcomes Alignment Matrix									
PLO	A1	A2	A3	A4	B1	B2	C1	C2	C3
1.1	√	√	√	√					
1.2	√	√	√	√					
1.3	√	√	√	√					
1.4									
1.7									
2.1					√				
2.2					√				
2.7						√			
3.1							√	√	
4.3									√

Course Contents and Schedule

Week	Day and Date	Topics to be covered	Method of instruction	CLOs	PLOs
1	Sun. 24/7 - Thur. 28/7	2.2 SI units, non-SI units Decimal Multipliers, laboratory Measurements. 2.3 Uncertainty, Significant figures. Accuracy & Precision 2.4 Factor-Label method 2.5 Density and specific gravity,	In-class lecture	B2, C3	2.7, 4.3
2	Sun. 31/7 - Thur. 4/8	3.2 The periodic table 3.3 Formula of ionic compound 3.5, 3.7 Nomenclature of ionic and molecular compounds. 4.1 Molecular and formula masses, The mole concept, 4.2 Percentage composition, Chemical formulas,	In-class lecture	A4	1.1, 1.2, 1.3
			In-class lecture	A1, B2, C3	1.1, 1.2, 1.3 2.7, 4.3
3	Sun. 7/8 Thur. 11/8	4.3 Determining Empirical and Molecular Formulas 4.4 Balancing chemical equations, Stoichiometry, 4.5 Limiting reactant, 4.6 Yield	In-class lecture	A1, B2, C3	1.1, 1.2, 1.3 2.7, 4.3
4	Sun. 14/8 Thur. 18/8	11.2 Measurement of Pressure 11.3 gas law (Pressure, Pressure- volume-temperature relationships) 11.4 Stoichiometry of reactions 11.5 Ideal gas laws, between gases, 11.6 Dalton's law, Graham's law, 11.7 Kinetic theory, 11.8 Real gases	In-class lecture	B2, C3	2.7, 4.3
			In-class lecture	B2, C3	2.7, 4.3



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5	Sun. 21/8 Thur. 25/8	15.1 Dynamic equilibrium in chemical systems, 15.2 Equilibrium law for chemical reactions, 15.3 Equilibrium Laws Based on Pressures or Concentrations, Relationship between Kc and Kp, 15.4 Heterogeneous equilibria, 15.6 Le Chatelier's principle, 15.7, 15.8 Equilibrium calculations	In-class lecture	A3, C3	1.1, 1.2, 1.3, 4.3
			In-class lecture Assignment	A3, C3	1.1, 1.2, 1.3, 4.3
6	Sun. 28/8 Thur. 1/9	14.1 Rate of reaction, Factors that affect reaction rates, 14.2 Measuring rate of reaction, 14.3 Rate Law, 14.4 Integrated Rate Law 14.5 Molecular Basis of Collision Theory 14.7 Activation energy, 14.9 Catalysts	In-class lecture	B1, C2	2.1, 2.2, 3.1
			Assignment		
			In-class lecture	B1, C2	2.1, 2.2, 3.1
			Assignment		
7	Sun. 4/9 Thur. 8/9	7.1 Energy, 7.3 heat and Calorimetry, P-V work, 7.4 Energy changes in chemical reactions 7.5 First, laws of thermodynamics, 7.6 Enthalpy, 7.7 thermochemical equation 7.8 Hess's law, 7.9 Standard heat of formation	In-class lecture	B1, B2, C1, C3	2.1, 2.2, 2.7, 3.1, 4.3
			Assignment		
			In-class lecture	B1, B2, C1, C3	2.1, 2.2, 2.7, 3.1, 4.3
			Assignment		
8	Sun. 11/9 Thur. 15/9	19.2 spontaneity, 19.3 Entropy 19.4 The second law of thermodynamics, 19.5 The third law of thermodynamics 19.6 Gibbs free energy, 19.7 Free energy and maximum work, 19.8 Free energy and equilibrium	In-class lecture	B1, B2, C1, C3	2.1, 2.2, 2.7, 3.1, 4.3
			Problem Solving		
			Assignment	B1, B2, C1, C3	2.1, 2.2, 2.7, 3.1, 4.3
			Problem Solving		
9	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	
Reports	
Project	
Case-Study	
Final Exam	50	TBA

Supplementary Reading



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Textbook:

- Principles of Chemistry: A Molecular Approach, Nivaldo J. Tro, Published by Brand: Prentice Hall (2011), ISBN 10: 0321750098 ISBN 13: 9780321750099

References:

- Silberberg, M.; Amateis, P., Chemistry: The Molecular Nature of Matter and Change, 7th Ed., 2015, McGraw-Hill.
- Ebbing, D. D.; Gammon, S. D., General Chemistry, 8th Ed., Houghton Mifflin Co.



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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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