



Course Specifications

Course Title:	General Chemistry 2
Course Code:	4022131-2
Program:	Chemistry
Department:	Department of Chemistry
College:	Faculty of Applied Science
Institution:	Umm Al-Qura University

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A. Course Identification

1. Credit hours:
2. Course type
a. University <input type="checkbox"/> College <input type="checkbox"/> Department <input checked="" type="checkbox"/> Others <input type="checkbox"/>
b. Required <input checked="" type="checkbox"/> Elective <input type="checkbox"/>
3. Level/year at which this course is offered: 3 rd level / 2 nd year
4. Pre-requisites for this course (if any): General Chemistry 1
5. Co-requisites for this course (if any): ---None

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	√	75%
2	Blended	---	---
3	E-learning	√	25%
4	Distance learning	---	---
5	Other	---	---

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	Lecture	22
2	Laboratory/Studio	0
3	Tutorial	0
4	Others (E- learning + Exams + office hours)	10
	Total	32

B. Course Objectives and Learning Outcomes

1. Course Description

The course deals with the basic concepts of general chemistry including atomic construction, Lewis structures of compounds, theories of bonding, the principal quantum numbers, classification and properties of elements in the periodic table.

2. Course Main Objective

By finishing of this course, the students will be able to discuss and explain:

- The atomic construction, atomic shells, their shapes
- Electronic structure and Lewis structures of different chemical compounds.
- The valence shell electron pairs repulsion theory, molecular orbital theory and valence bond theory.

The principal quantum numbers, classification of elements and properties of ionic and covalent compounds.

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	Knowledge and Understanding	
1.1	Recognize the valence shell electron pairs repulsion theory, valence bond theory and molecular orbital theory	K1
1.2	Classify the elements in the periodic table into periods and groups and discuss their periodic properties.	K2
1.3	Describe the atomic construction, atomic shells and their shapes.	K1
2	Skills:	
2.1	Illustrate the four quantum numbers for different electrons in an atom	S2
2.2	Determine the rules of different theories to predict the geometrical shapes of covalent compounds.	S1
2.3	Compare between different compounds according to the the types of chemical bonds connecting their atoms or ions.	S1
2.4	Apply IT and communication technology in gathering and interpreting information concerning the course topics.	S5
3	Values:	
3.1	Work indvedually to use the on-line libraries for searching and interpreting the course topics.	V2
3.2	Write and present, collaboratively and constructively, reports related to course topics.	V3

C. Course Content

No	List of Topics	Contact Hours
1	Atomic construction – atomic shells and their shapes.	2
2	Chemistry of Principle quantum numbers.	2
3	Properties of elements and the periodic table – classification of elements into periods and groups.	3
4	Comparison between some properties of the elements inside the period such as; ionization energy, electron affinity, electronegativity and atomic size.	2
5	Chemical bonds; their types and theories – Lewis symbols and structures.	4
6	Midterm exam	1
7	Valence shell electron pairs repulsion theory.	3
8	Valence bond theory.	2
9	Hybridization and its types	2

10	Molecular orbital theory – octet rule.	2
11	Properties of ionic and covalent compounds.	2
12	Introduction of crystal field Theory	3E
	Applications on theories	3E
	Finl exam	2
Total		31

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	Knowledge and Understanding		
1.1	Recognize the valence shell electron pairs repulsion theory, valence bond theory and molecular orbital theory	Lecture	Active participation of students within their group on blackboard periodic exams. final exam.
1.2	Classify the elements in the periodic table into periods and groups and discuss their periodic properties.	Lecture scientific discussion	Quiz Midterm exam final exam.
1.3	Describe the atomic construction, atomic shells and their shapes.	Self-Directed Study private	Assignments and activities
1.4	Introduction of Crystal Field Theory	E-learning	Assignments on blackboard
2.0	Skills		
2.1	Illustrate the four quantum numbers for different electrons in an atom	E- learning	Assignments and activities on blackboard
2.2	Apply the rules of different theories to predict the geometical shapes of covalent compounds.	Lecture scientific discussion	Quiz Midterm exam final exam.
2.3	Compare between different compounds according to the the types of chemical bonds connecting their atoms or ions.	Lecture scientific discussion	Midterm exam Final exam
2.4	Apply IT and communication technology in gathering and interpreting information concerning the course topics	Web-based study	Activites. - Assignments on blackboard
3.0	Values		
3.1	Work indvedually to use the on-line libraries for searching and interpreting the course topics.	Web-based study	Activites
3.2	Write and present, collaboratively and constructively, reports related to course topics.	Library visits Web-based study	Assignments

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Assignments and activities	All weeks	10 %
2	E-learning	All weeks	10 %
3	Mid-term Exam	6	30 %
4	Final Exam (2 hours exam)	12	50 %

*Assessment task (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice:

- Office hours: During the working hours weekly,
- Academic advising for students.
- Availability of Staff members to provide counseling and advice.

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	- General Chemistry: The Essential Concepts 7th Edition by Raymond Chang Dr., Kenneth Goldsby Professor, 2013.
Essential References Materials	- Catherine Housecroft and Alan G. Sharpe Inorganic Chemistry, 4th ed. Pearson, 2012. - J. D. Lee, Concise Inorganic Chemistry, 5th ed., Wiley-Blackwell, 1998. - H. B. Gray. Chemical Bonds: An Introduction to Atomic and Molecular Structure, University Science Books, 1994.
Electronic Materials	• http://www.chemweb.com • http://www.sciencedirect.com • http://www.rsc.org
Other Learning Materials	• Not required.

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Well-equipped lecture halls.
Technology Resources (AV, data show, Smart Board, software, etc.)	Room equipped with computer, data show and TV.
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	No other requirements.

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Quality of learning resources	Students	Complete the questionnaire evaluation of the course periodically.
Effectiveness of teaching and assessment.	Program Leaders	Periodic review of final exams and the student's degrees in this course.
Extent of achievement of course learning outcomes.	Peer Reviewer	Checking selected exam papers, and student assignments.

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)

Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	Quality committee and department Council
Reference No.	1 st meeting
Date	2021

Head of Chemistry Department


Dr Moataz Morad

