Course Specification

(Bachelor)

Course Title:	General Chemistry
Course Code:	GE 313
Program:	Basic Science
Department:	Basic Science
College:	Computer and Information Sciences
Institution:	Majmaah University
Version:	1
Last Revision Date:	14-9-2023

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours: (3 (3,0,1))					
2. Course type					
A.	☐University	☒ College	☐Department	☐Track	☐Others
B.	☐Required		☐Elective		
3. Level/year at which this course is offered: Level6					
4. Course general Description:					
This course is introducing the following topics: Introduction, The study of chemistry, Physical and chemical properties of matter, Atoms, Molecules and Ions, The Atomic theory, The Electronic structure of Atoms, the Photoelectric effect, Bohr's Theory of the Hydrogen Atom, The Dual Nature of the Electron, Quantum Mechanics, Quantum Numbers, Atomic orbitals, Electronic Configuration,Periodic Table, Periodic Classification of the elements, Periodicity of properties, Ionization energy, Chemical Bonding, Formation of sodium chloride, Electrochemistry, Redox reactions, Batteries, Acids and Bases, Bronsted acids and bases, Lewis acids and bases, PH- a measure of acidity, Chemistry in the Atmosphere					
5. Pre-requirements for this course (if any)**:**					
Nil					
6. Pre-requirements for this course (if any)**:**					
Nil					
7. Course Main Objective(s):					
This is an introductory course. Students will become proficient in applying their knowledge of Chemistry. The goal of this course is to provide the student with fundamentals and basic chemical engineering concepts which directly related to the engineering sciences. This course is appropriate both as an introductory course for chemistry and other science majors as well as an introductory and terminal course for non-science majors who desire a foundation in chemical principles. The primary learning outcomes are learning the fundamental nature of chemicals and chemical systems and becoming familiar with the language and symbols of chemistry.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	60	100%
2	E-learning		
3	Hybrid • Traditional classroom • E-learning		
4	Distance learning		

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	45
2.	**Laboratory/Studio**	
3.	**Field**	
4.	**Tutorial**	15
5.	**Others (specify)**	
Total		60

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1				
1.2				
...				
2.0	**Skills**			
2.1				
2.2				
...				
3.0	**Values, autonomy, and responsibility**			
3.1	Gain knowledge of the basic concepts and principles of Chemistry		Lectures, Discussions	Assignments/ quiz/class test /Mid-Term

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
				exams /Final Exam
3.2	Understand the concepts and principles of Chemistry		Lectures, Discussions	Assignments/ quiz/class test /Mid-Term exams /Final Exam
3.3	Analyze the Chemical problem and can be able to express it as a chemical equation.		Lectures, Discussions	Assignments/ quiz/class test /Mid-Term exams /Final Exam
3.4	Apply the basic principles of Chemistry in solving problems in a structured process.		Lectures, Discussions	Assignments/ quiz/class test /Mid-Term exams /Final Exam
3.5	Able to use necessary techniques and skills in solving chemical problems.		Lectures, Discussions	Assignments/ quiz/class test /Mid-Term exams /Final Exam
...				

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction: The scientific method, classifications of matter, Physical and chemical properties of matter, measurement, Handling Numbers, Dimensional Analysis in solving problems.	4
2.	The Atomic theory, The structure of Atom, Atomic Number, Mass Number and Isotopes	4
3.	The Periodic Table, Molecules and Ions, Chemical formulas, Naming Compounds, Introduction to Organic compounds	4
4.	From Classical Physics to quantum theory, the Photoelectric effect, Bohr's Theory of the Hydrogen Atom	4
5.	The Dual Nature of the Electron, Quantum Mechanics, Quantum Numbers, Atomic orbitals, Electronic Configuration, The Building-Up Principle	4
6.	Development of the Periodic table, Periodic Classification of the elements, Periodicity of properties, Ionization energy, Electron affinity.	4

7.	Lewis Dot Symbols, The Ionic Bond, Lattice Energy of Ionic Compounds, Formation of Sodium chloride	4
8.	The Covalent bond, Electronegativity, Writing Lewis structures, Formal charge and Lewis Structure, Resonance, Exceptions to the Octet Rule.	4
9.	Redox reactions, Balancing redox equations,	4
10.	Galvanic cells, Batteries.	4
11.	Arrhenius concept of acids and bases, Bronsted acids and bases	4
12.	Lewis acids and bases, The Acid-Base Properties of Water, PH- a measure of acidity	4
13.	Earth's Atmosphere, Phenomena in the outer layers of Atmosphere, Depletion of ozone in the stratosphere	4
14.	volcanoes, The greenhouse effect, Acid rain, Photo chemical smog, Indoor pollution	4
15.	Revision	4

Total		**60**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	**Participation and Exercise in class**	During the term	05%
2.	**Homework**	During the term	10%
3.	**Midterm**	8th week	20%
4.	**Class Test**	12th week	15%
5.	**Quiz**	4th week	10%
6.	**Final Exam**	14th week	40%
7.	**Total**		**100%**
...			

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	**Textbook:** **1. Chemistry, Raymond Chang, 10th. Ed. McGraw - Hill, 2010, ISBN: 978-007-127220-9.**
Supportive References	**2. Engineering Chemistry, Extended Edition, Wiley India, ISBN: 9788126536337Engineering Chemistry, P.R. Vijayasarathy, 2th. Ed. Eastern Economy.** **Schum's Outline Beginning Chemistry, David E. Goldberg, PhD, McGraw-Hill, 1997.**
Electronic Materials	**http://science.pppst.com/chemistry.html** **http://www.sciencegeek.net/Chemistry/Powerpoints2.shtml** **http://www.chem1.com/chemed/genchem.shtml** **http://www.wiredchemist.com/chemistry/instructional/intro_chem_contents.html** **http://chemwiki.ucdavis.edu/Wikitexts** **http://www.chem1.com/acad/webtext/virtualtextbook.html** **http://wiki.chemeddl.org/index.php/Collections:Texts:Chemistry**
Other Learning Materials	**-----**

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	**Classroom**
Technology equipment (projector, smart board, software)	**Enough facilities are present (Such as projector, Video conferencing machine)**
Other equipment (depending on the nature of the specialty)	**----**

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Indirect
Effectiveness of Students assessment	Instructor	Direct
Quality of learning resources	Instructor	Direct
The extent to which CLOs have been achieved		
Other		

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	
REFERENCE NO.	
DATE	