هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission
اعتماد
NCAA
2024
TP-153

Course Specification
(Bachelor)

Course Title:	General Chemistry 2
Course Code:	CEM103
Program:	Chemistry
Department:	Chemistry
College:	College of Science
Institution:	Majmaah University
Version:	TP-153
Last Revision Date:	16 December 2024

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours: (3h (2+2))					
2. Course type					
A.	☐University	☐College	☒ Department	☐Track	☐Others
B.	☒ Required		☐Elective		
3. Level/year at which this course is offered: (2nd Level/1st Year)					
4. Course General Description:					
The course deal with the basic concepts of general chemistry including atomic construction, Lewis structure of compounds, theories of bonding, the principal quantum numbers, classification and properties of elements in the periodic table. Also, to know the basic of kinetic, electrochemistry and thermodynamic					
5. Pre-requirements for this course (if any):					
General Chemistry 1. CEM 101					
6. Co-requisites for this course (if any):					
7. Course Main Objective(s):					
By ending of this course, the student will be able to discuss and explain: • The atomic construction, atomic shells, their shapes • Electronic structure and Lewis structure of different chemical compounds • The valence shell electron pairs repulsion theory, moleciar orbital theory and valence bond theory • The principal quantum numbers, classification of elements and properties of ionic and covalent bonds • Basic of kinetic, electrochemistry and thermodynamics					

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		

No	Mode of Instruction	Contact Hours	Percentage
	• E-learning		
4	Distance learning		

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	30
2.	**Laboratory/Studio**	30
3.	**Field**	
4.	**Tutorial**	
5.	**Others (specify)**	
Total		60

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

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Demonstrate knowledge and understanding of the basics and concepts in chemistry(atomic structure- electromagnetic radiation- and chemical kinetic)	**K1**	- (PowerPoint). - Demonstration of a large number of problems solution in the class - Discussions - E-learning - Self-learning	- Midterms - Quizzes - Homework -Class participation -Encourage students to search the Internet for everything related to - Final exam - E-exam. - Lab report -Final Practical exam
1.2	Knowing the quantum numbers and classify the properties of ionic and covalent bonds	**K2**		
2.0	**Skills**			
2.1	Apply the knowledge and skill to solve problems relating to course concept	**S1**	Cooperative learning -Problem Solving -Interactive teaching	- Assignment - Homework -Research papers Request a share

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
2.2	Apply IT and communcation technology in gathering and interpreting information concerning the course topics	**S3**	- Discussion and dialogue - Active Learning - Peer Learning -Lectures for detailed practical manuals are provided for all practical parts.	Presentation -Testing different extents by the experiments achieved and reports associated with the chemistry course.
3.0	**Values, autonomy, and responsibility**			
3.1	Work independently to use the on-line Libraries for searching and interpreting	**V3**	Assignments (individual or group) at regular intervals to solve and submit on time. • Participation of students in classroom discussion and problem-solving sessions • Team work reports and presentations (data collection, internet search, data processing, analysis and reporting)	- Observing student's participation in group activity. - Checklist of the tasks carried out by the student. Observing student's participation in group discussion. - Lab report - Checklist of student's punctuality in submitting work on time.

C. Course Content

No	List of Topics	Contact Hours
1.	of atomic structure (Bohr's theory, electromagnetic radiation, regions of electromagnetic radiations- wave length for each region)	**4**
2.	quantum numbers (principal quantum number, magnetic quantum number, subsidiary quantum number and spin quantum number	**4**
3.	the electronic configuration of different elements in the periodic table aufbau principles, Hund's rule	**4**

4	the periodic table and periodicity of properties with atomic number(ionization energy- electron affinity-electro negativity	**4**
5	Chemical bonding (Lewis symbols and structures, oxidation numbers, ionic and covalent bonding, resonance)	**4**
6	Hybridization of atomic orbitals (sp3, sp2, and sp) and molecular shapes – introduction to valence bond theory	**4**
7	Intermolecular interactions (van der Waals equation, intermolecular forces)	**4**
8	Chemical Kinetics (Definition, stoichiometry, effect of concentration and order, rate law and constant, effect of temperature)	**2**
9	Practical experiments for theoretical lectures. • Safety in chemical lab and identification of apparatus and tools. • Preparation of standard solution from solid and liquid materials • Preparation of standard solutions by dilution • Simple titrations from neutralization reactions	**30**
Total		**60**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	First term exam	Week 6-7	10%
2.	Second term exam	Week 9-10	10%
3.	Electronic exam	Week 12	10%
4.	Homework and quiz	Continues during the semester	10%
5.	Practical exam	Week 14-15	20%
6.	Final exam	End of the semester	40%

*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	• General Chemistry Principle and structure, James E. Brady, John Wiley & Sons, Inc, 2000

	• Physical Chemistry, Peter Atkins and Julio De Paula, Freeman Publishers, 2010 • General Chemistry: The Essential concept, Raymond Change and Kenneth Goldsby, McGraw Hill, 2015. • Chemistry 10th edition, Raymond Chang, McGraw Hill, 2010.
Supportive References	
Electronic Materials	• Saudi Digital Library • Science-direct • Khan Academy on youtube
Other Learning Materials	• Microsoft office • Chem Sketch • Chem draw

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom can hold up to 40 students Laboratory can hold up to 30 students Lecture room and Laboratory contains Platform and computer
Technology equipment (projector, smart board, software)	Data show Smart Board computer Microsoft- office
Other equipment (depending on the nature of the specialty)	Availability of equipment relevant to the course material.

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	students	Questionnaire evaluation of the course
Effectiveness of Students assessment	Program/Department Instructor	Annual course report
Quality of learning resources	Program/Department Instructor	Annual course report
The extent to which CLOs have been achieved	Peer review	- Check marking of a sample of exam papers, or student work. -Exchange corrected sample of assignments or exam basis with another staff member for the same course in other faculty.
Other		

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**CHEMISTRY DEPARTMENT COUNCIL**
REFERENCE NO.	**17**
DATE	**16-12-2024**