Course Specification
(Bachelor)

Course Title:	**General Chemistry Lab**
Course Code:	**CHM 1105**
Program:	**Bachelor of Industrial Engineering, Chemical Engineering, Architecture Engineering, Civil Engineering, Electrical Engineering, Mechanical Engineering**
Department:	**Chemistry**
College:	**Science**
Institution:	**Imam Mohammed Ibn Saud Islamic University**
Version:	**2024 V1**
Last Revision Date:	12 October 2024

Table of Contents

A. General information about the course:

-1. Course Identification

1. Credit hours: 1 (0, 0, 2)					
1 (0 Lectures, 0 Tutorials, 2 Lab)					
2. Course type					
A.	☐University	☒ College	☒ Department	☐Track	☐Others
B.	☒ Required		☐Elective		
3. Level/year at which this course is offered: Level 1/ First year					
4. Course general Description:					
This course is intended to introduce students to major concepts and techniques in general chemistry through laboratory experiments.					
5. Pre-requirements for this course (if any)**:**					
None					
6. Co-requisites for this course (if any)**:**					
None					
7. Course Main Objective(s):					
By the end of this course the student able to: **Recognize the chemistry lab which is taken in parallel with the course and covers the following basic experiments: density, mass-mass relationship, limiting reactant, acid-base titrations, solubility product, reactions in aqueous solution, Calorimetry and redox reactions.**					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	30	100%
2	E-learning	0	0
3	Hybrid • Traditional classroom	0	0

No	Mode of Instruction	Contact Hours	Percentage
	• E-learning		
4	Distance learning	0	0

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	0
2.	**Laboratory/Studio**	0
3.	**Field**	0
4.	**Tutorial**	30
5.	**Others (specify)**	0
Total		30

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

Code	Course Learning Outcomes	Code of PLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Recall the theory that the students have learnt to be applied in the experiment.	K1	Lectures, Experiment	Quizzes, lab Exam
2.0	**Skills**			
2.1	Interpret the experimental data.	S.1	Experiment	• Lab report
2.2	Calculate the needed parameter or items of my experiment using mass and energy balances.	S.3	• Experiment, Discussion	• Exam, lab report
2.3	Summarize the experimental work and understand the laboratory manual.	S.3	• Experiment	• Lab Report
2.4	Conduct experiments.	S.1	• Experiment	• Lab Report

Code	Course Learning Outcomes	Code of PLOs aligned with program	Teaching Strategies	Assessment Methods
3.0	Values, autonomy, and responsibility			
3.1	To demonstrate responsibility for their own learning and motivate for Team Work.	V1	Brain Storms Exercises • Group Discussion	Oral Discussion. • Group Discussion and Assignments

C. Course Content

No	List of Topics	Contact Hours
1	Safety and precautions in the chemistry laboratory.	2
2	Density of liquids ,water , alcohol, oil	2
3	Density of regular and irregular solids	2
4	The chemical composition by mass percentage	2
5	Stoichiometry: Mass-mass relationship	2
6	Determination of the empirical formula	2
7	Preparation of primary standard solutions.	2
8	Standardization of a secondary standard solution.	2
9	Strong acid-strong base titration	2
10	Vinegar Analysis, Mass %	2
11	Reactions in Aqueous Solutions & Precipitation reaction & Limiting reactant	4
12	Redox titration of Fe^{2+}	2
13	Determination of the specific heat of metal	2
14	Determination of heat of Neutralization & Determination of heat of Dilution	2
15	Revision	2
	Total	30

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Midterm1	8th week	20%
2.	Lab Reports	Every week	40%
3.	Final Exam	Around 16th -17th week	40%
6.	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	**Lab Manual**
Supportive References	**• CHEMISTRY, T. Brown, H. Lemay Jr., B. Bursten and C. Murphy, Pearson International Edition, 11th Edition, 2009** **• • CHEMISTRY, Raymond Chang McGraw-Hill, 9th Edition, 2007.**
Electronic Materials	**• Internal server:** **• http://mathworld.wolfram.com/**
Other Learning Materials	**www. Elesevier.com**

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	• **Each Laboratory should be equipped with a maximum 25 seats** • **In each laboratory, a list of safety and precautions are provided.** • **In each lab has proper ventilation, and well equipped with instruments.** • **In each lab, containers for solid waste, liquid waste, and crushed glasses.** • **Each lab has a small pharmacy for first aid in case of an accident** • **In each lab, the rules, conditions, and safety mechanism as well list of Risk, Safety precautions according to Merck Catalogue are hanging in the labs.**
Technology equipment (projector, smart board, software)	**The rooms are equipped with Smart Board, WI-FI access.**
Other equipment (depending on the nature of the specialty)	• **Appropriate Glassware for carrying the requested experiments (burrete, pipets, conical flasks, beakers, measuring cyliders, curecibles, dishes, funnels, buchner, buchner flasks)** • **Appropriate chemicals and solvents (Sodium hydroxide, Barium Chloride, Hydrochloric acid, Sulphuric acid, phenolphthalein, methyl orange, ferric sulfate, ferrous sulphate, potassium permanganate, lead acetate)** • **Furnace Oven, Analytical balance (3 digits), Drying oven** • **Filter papers , clamps, stands**

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	**Students**	**Direct:** Questionnaire.
	Course Responsible	**Direct:** Course e-Portfolio. **Indirect:** Second examiner checklist-Course report.
	Peer Reviewer	**Direct:** Questionnaire. **Indirect:** External assessor report.
Effectiveness of Students assessment	**Program Leaders**	**Direct:** Course e-Portfolio. **Indirect:** Course report.
Quality of learning resources	**Students**	**Indirect:** Second examiner checklist-Course report.
	Faculty (Academic Advisory)	**Direct:** course Entrance/Exit. **Indirect:** Observations - Accreditation review.
	Program Leaders	**Direct:** Course e-Portfolio. **Indirect:** Course evaluation survey- Observations- Syllabus review- Accreditation review.
The extent to which CLOs have been achieved	**Course Responsible**	**Direct:** Exams - Course e-Portfolio. **Indirect:** Second examiner checklist-Course report.
	Program Leaders	**Indirect:** Exams.
Lab Performance	**Students**	**Direct:** Lab reports, Final Lab exam, Course e-Portfolio.
	Course Responsible	

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**COUNCIL OF DEPARTMENT OF CHEMISTRY**
REFERENCE NO.	**7 (NO. 2/3)**
DATE	**29/3/1446 - 2/10/2024**