هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

2023
TP-153

Course Specification
(Bachelor)

Course Title:	Principles of Analytical Chemistry
Course Code:	CHEM213-3
Program:	Bachelor of Science in Chemistry
Department:	Department of Physical Sciences
College:	College of Science
Institution:	Jazan University
Version:	TP-153 (2024)
Last Revision Date:	31 January 2024

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours: (3 hrs)

2. Course type

A.	☐University	☐College	☒ Department	☐Track	☐Others
B.	☒ Required		☐ Elective		

3. Level/year at which this course is offered: (4th Level/ 2nd Year.)

4. Course general Description:

Course title	Course code	Contact Hours			Credit Hours	Year	Level	Prerequisite	Corequisite
		Lec	Tut	Lab					
Principles of Analytical Chemistry	CHEM213-3	3	-	-	3	2nd	4th	CHEM205-3	CHEM214-2

This course aims to give students the theoretical principles of quantitative chemical analysis (volumetric and gravimetric).

5. Pre-requirements for this course (if any)**:**

CHEM205-3

6. Co-requisites for this course (if any)**:**

CHEM214-2

7. Course Main Objective(s):

1. Recognize the fundamentals, concepts, and terminology of quantitative chemical analysis (volumetric and gravimetric).
2. Recognize the advantages and disadvantages of quantitative chemical analysis methods (volumetric and gravimetric).
3. Acquiring the skills necessary for calculating solution concentrations in different units.
4. Acquiring the mathematical skills used in quantitative chemical analysis (volumetric and gravimetric).

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	$(3 \times 15)45$	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** **3x15=45**	45
2.	**Laboratory/Studio**	-
3.	**Field**	-
4.	**Tutorial**	-
5.	**Others (specify)**	-
Total		45

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;** Upon completion of the course, students are able to:			
1.1	**Demonstrate a broad understanding and critical view of the principal theories, concepts, and terminology related to Principles of Analytical Chemistry topics (I)**	**K1**	**lecture/discussion/Seminars /presentation**	**oral and written examinations**
1.2	**Describe and explain correctly chemical phenomena, chemical principles, essential facts and theories related to both of Volumetric and gravimetric methods of analysis (I)**	**K2**	**lecture/discussion/Seminars /presentation**	**oral and written examinations**
2.0	**Skills;** Upon completion of the course, students are able to:			
2.1	**Demonstrate ability in critical thinking, numeracy, statistical, analytical reasoning, and use of graphs and charts to solve problems related to volumetric and gravimetric methods. (I)**	**S1**	**lecture / discussion / Seminars /Individual presentation**	**oral and written examinations**

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction to quantitative chemical analysis	1
2.	Unites for expressing concentration; normality, molarity and molality	4
3.	Unit percent: w/w, w/v and v/v% in addition units of part per million, part per billion.	3
4.	Conversion between some concentration units	2
5.	Dilution of solutions, solution preparation, titrations based on acid-base reactions	4
6.	Simple titration curves (strong, weak acids versus strong , weak bases) ,complicated titration curves and calculation of pH during titrations	4
7.	Theory of acid-base indicators and titrations based on oxidation reduction reactions	4
8.	Titration curves of oxidation reduction reactions and applications.	4
9.	Titrations based on complexation reactions, applications and titrations based on precipitation reaction.	4
11	Gravimetric methods of analysis- precipitation gravimetry - gravimetric calculations	4
12	Types of precipitates – properties of the ideal precipitates	3
13	Steps to improve precipitates properties - mechanism of precipitation process	4
14	precipitates contamination- organic and inorganic precipitating agents.	4
Total		$3 \times 15\text{w} = 45$

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	*Periodic Exams*	*During Semester*	*30%*
2.	*Assignments & Classroom Activities*	*During Semester*	*20%*
6.	*Final Exam*	*16-17*	*50%*
	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	**Skoog, Douglas, Donald West, F. L. Holler, and Stanley Crouch. Fundamentals of analytical chemistry. Cengage Learning, 10th Edition 2021**
Supportive References	**R. M. Verma, Analytical Chemistry, Theory and Practice, 3rd edition, 2020**
Electronic Materials	**Some course contents and materials are posted on Blackboard sites**
Other Learning Materials	**None**

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	1 Lecture room(s) for groups of 50 students
Technology equipment (projector, smart board, software)	Smart board, Data show, Black board, internet
Other equipment (depending on the nature of the specialty)	None

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Student	Likert-type Survey CES) Indirect
Effectiveness of Students' assessment	Instructor & Course coordinator	Class room evaluation (direct & indirect
Quality of learning resources	Program Coordinator	Indirect
The extent to which CLOs have been achieved	Assessment committee	Indirect
Other		

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	Physical Sciences Department Council
REFERENCE NO.	Meeting (3)
DATE	12/03/2024 -02/09/1445