هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

2023
TP-153

Course Specification
(Bachelor)

Course Title:	Analytical Chemistry Lab
Course Code:	CHEM214-2
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: (2hrs)					
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					
Analytical Chemistry lab	CHEM214-2	-	-	4	2	2nd	4th	-----	CHEM213-3

This course aims to study and carry out the practical experiments used in quantitative chemical analysis (volumetric and gravimetric).

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

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

CHEM213-3

7. Course Main Objective(s):

1- Recognize the different lab equipment and devices and how they can be used.
2- Acquiring the skills necessary to prepare solutions using different methods and units.
3- Practical training on conducting the required chemical analyses.
4- Ability to analyze and interpret the obtained results

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional lab room	$(4 \times 15) = 60$	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**	
2.	**Laboratory/Studio**	60
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 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 the principles, concepts, classification, and terminology of different practical experiments related to quantitative chemical analysis (volumetric and gravimetric)**	**K1**	**Lab / discussion /Presentation**	**oral and written examinations**
1.2	**Describe and explain correctly chemical phenomena, chemical principles, essential facts, and theories related to practical experiments in the field of quantitative chemical analysis (volumetric and gravimetric)**	**K2**	**Lab / discussion /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**
2.2	**Acquire the practical skills to Apply their experimental basics and skills to use laboratory equipment, and classical techniques for carrying out different experiments related to quantitative chemical analysis (volumetric and gravimetric) and to write a report representing the scientific data (I)**	**S2**	**Lab work, group work**	**Lab final exam / lab report rubric/ Objective questions**

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
2.3	**Use the analytical tools and equipments to analyze different samples.**	**S3**	**Lab work, group work**	**Lab report/ Lab notebook.**
2.4	**Apply the proper procedures and regulations for the safe handling, use, and disposal of chemicals during carrying out experiments related to quantitative chemical analysis (volumetric and gravimetric) (I)**	**S4**	**Lab demonstrations / hands-on student learning activities**	**Safety exam**
3.0	**Values, autonomy, and responsibility;** Upon completion of the course, students are able to:			
3.1	**Work in groups and teams in cooperation with other colleagues.**	**V1**	**ab demonstrations / whole group and small group discussion**	**practical group work Rubric**

C. Course Content

No	List of Topics	Contact Hours
1.	Laboratory safety	2
2.	Solution preparation	4
3.	Determination of normality and strength of unknown sodium hydroxide solution by oxalic acid	4
4.	Determination of normality and strength of unknown hydrochloric acid by solution known Sodium hydroxide	4
5.	Revision	4
6.	Determination of normality and strength of unknown sodium carbonate solution by standardized Hydrochloric acid solution	4
7.	Determination of normality and strength of unknown potassium permanganate solution by standard oxalic acid solution	4
8.	Determination of normality and strength of unknown ammonium ferrous sulphate solution by standard potassium dichromate solution	4
9.	Determination normality and strength of sodium thiosulfate using standard solution of potassium dichromate (iodomeyric titration)	4
10.	Determination normality and strength of magnisum sulphate using standard solution of EDTA (complexmetryl)	4

11.	Basic concepts, terminology and gravimetric calculations	2
12.	Determination of the number of water of crystallization in barium chloride dihydrate	2
13.	Gravimetric analysis of sulphate as BaSO4	4
14.	Gravimetric determination of calcium as calcium Oxide	4
15.	Gravimetric determination of nickel as nickel dimethylglyoxim	4
16.	Gravimetric determination of lead as lead chromate	4
17.	Revision	2
Total		$4 \times 15W = 60h.$

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	*Learning Activities*	*During semester*	*25%*
2.	*Lab work*	*During semester*	*35%*
6.	*Final Exam*	*16*	*40%*
	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	M. Alam, M. Akhtar, H. Asif. Textbook of Practical Analytical Chemistry, (2010).
Supportive References	Quantitative Chemical Analysis & Solutions manual by Daniel C. Harris, 2006.
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. 1 Lab room(s) for groups of 25 students
Technology equipment (projector, smart board, software)	Smart board, Data show, Black board, internet

Items	Resources
Other equipment (depending on the nature of the speciality)	Laboratory glassware and equipment such as erlenmeyer flasks watch glass, graduated cylinder, volumetric flask, graduated pipette, volumetric buret and beakers, water bath, magnetic stirrer, Electronic balance and hot plate….etc.

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	Classroom 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