هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

2023
TP-153

Course Specification
(Bachelor)

Course Title:	Environmental Analysis
Course Code:	CHEM411-2
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: (2hr)					
2. Course type					
A.	☐University	☐College	☒ Department	☐Track	☐Others
B.	☐Required		☒ Elective		
3. Level/year at which this course is offered: (7th Level/4th Year)					
4. Course general Description:					

Course title	Course code	Contact Hours			Credit Hours	Year	Level	Prerequisite	Corequisite
		Lec	Tut	Lab					
Environmental Analysis	CHEM411-2	1	-	2	2	4th	7th	CHEM311-4	-

This course aims to give students the basic concepts and skills in environmental analysis, environmental problems, and environmental pollution

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

CHEM311-4

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

None

7. Course Main Objective(s):

1- Providing the student with the basic concepts of environmental analysis.
2- Increasing student understanding of the most critical environmental challenges, problems, and environmental pollution.
3- Applying the analytical skills the students previously acquired to analyze real environmental sample

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	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**	$1 \times 15 = 15$
2.	**Laboratory/Studio**	$2 \times 15 = 30$
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 environmental analysis topics and the analytical methods used for this purpose (M)**	K1	lecture/discussion/Seminars/presentation	oral and written examinations/ laboratory reports
1.2	**Describe the main techniques and instrumentations used in the analysis of environmental samples and their advantages limitations and applications (M)**	K2	lecture/discussion/Seminars/presentation	oral and written examinations/ laboratory reports
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 environmental analysis topics. (M)**	**S1**	lecture/discussion/Seminars/presentation	oral and written examinations/ laboratory reports
2.2	**Perform experiments using various traditional and instrumental techniques used for the analysis of environmental samples and ability to record, analyze, and interpret the analytical data obtained, and write reports (M)**	**S2**	Lab work, group work	Lab report/ Lab notebook.

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
2.3	**Apply the proper procedures and regulations for the safe handling, use, and disposal of chemicals during the analysis of environmental samples experiments (M)**	**S4**	Lab demonstrations / hands-on student learning activities	**Safety exam**
2.4	**Clearly communicate the results of scientific work in the field of environmental analysis topics in oral, written, and electronic formats to both scientists and the public at large. (M)**	**S5**	**Presentation /reports**	**Oral presentation /reports**
3.0	**Values, autonomy, and responsibility;** Upon completion of the course, students are able to:			
3.1	**Working as a group leader in cooperation with other colleagues. (M)**	**V1**	lab demonstrations / whole group and small group discussions	group project reports / Practical assignments and laboratory reports
3.2	**Recognize the chemist's professional and ethical responsibilities**	**V2**	Research project/presentation	ethic rubric

C. Course Content

1- Theoretical Part

No	List of Topics	Contact Hours
1.	Introduction to the environment – pollution and its types	2
2.	Environmental analysis - pollutants transfer in the environment and their analytical methods	2
3.	Analysis of environmental solid samples (soil, sediments, and biological samples)	2
4.	water analysis (the primary constituents of natural water: pH, acidity, alkalinity, total solids, water hardness, dissolved oxygen, organic substances, oxygen demand, nutrient elements for plants, and trace pollutants)	7

5.	Air analysis (gases and suspended solids)	2
Total		$1 \times 15 = 15$

2- Lab work

Practical experiments to analyze different environmental samples (soil, biological samples, water, and air)

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	*Periodic Exams*	*During Semester*	*15%*
2.	*Assignments & Classroom Activities*	*During Semester*	*5%*
3.	*Lab Work*	*During Semester*	*30%*
4.	*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	1. **Introduction to Environmental Analysis, Roger Reeve, 2002, John Wiley & Sons Ltd.** 2. **Practical Environmental Analysis, Miroslav Radojević and Vladimir N Bashkin, 2006, RSC Publishing.**
Supportive References	**Environmental sampling and analysis: lab manual, Maria Csuros, 1997, CRC Press.**
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 Hall for 30 students equipped with modern teaching technology (projector, smart board, computer and internet)

Items	Resources
	2. Laboratory in accordance with the rules of safety and personal protection accessories should be available to all students
Technology equipment (projector, smart board, software)	- Laptop computer, smart board and internet access in the classroom and laboratory
Other equipment (depending on the nature of the specialty)	Chemicals and standards used in lab experiments - Related analytical equipment and instruments such as atomic absorption,uv-vis spectrophotometer, spectrofluorometer, GC, HPLC, UV lamp for TLC, separation columns and accessories, pH meter, analytical balance, …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	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 Reviewer, 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