جامعة الإسراء
ISRA UNIVERSITY

Course Syllabus

According to JORDAN National Qualification Framework (JNQF)

Course Name: Environmental Chemistry

Course Number: 11014137

General Course Information:

Course title	**Environmental chemistry**
Course number	**11014137**
Credit hours	**3**
Education type	**[Hybrid (Synchronous, Asynchronous)]**
Prerequisites/Corequisite	**11013131**
Academic Program	**Bachelor in Chemistry**
Program code	**01**
Faculty	**Science**
Department	**Chemistry**
Level of course	**Third or fourth year**
Academic year /semester	**2021/2022- Summer semester**
Awarded qualification	**Bachelor degree in Chemistry**
Other department(s) involved in teaching the course	**-**
Language of instruction	**English**
Date of production/revision	**05/07/2022**

Course Coordinator:

Coordinator's name	**Dr. Alaa Al-Ma'abreh**
Office No	**4204**
Office Phone extension number	**2527**
Office Hours	**Available 11-2 Sunday, Monday, Tuesday, and Wednesday**
Email	**alaa.almaabreh@iu.edu.jo alaamabreh@yahoo.com**

Other Instructors:

Instructor name	**Dr. Alaa Al-Ma'abreh**
Office No	**4204**
Office Phone extension number	**2527**
Office Hours	**11-2 Sunday, Monday, Tuesday, and Wednesday**
Email	**alaa.almaabreh@iu.edu.jo alaamabreh@yahoo.com**

Course Description *(English/Arabic)*:

English	Introduction to environmental chemistry; components of the environment (atmosphere, soil and water); chemical compounds in the environment and their sources; chemical reactions and processes in the environment with all its components; environmental problems; analytical methods used to monitor the chemical components of air, water, and soil
Arabic	مقدمة في كيمياء البيئة, مكونات البيئة (الغلاف الجوي ، التربة والمياه) ، المركبات الكيميائية في البيئة ومصادرها ، التفاعلات الكيميائية والعمليات في البيئة بجميع مكوناتها, المشاكلات البيئية ، الطرق التحليلية المستخدمة لرصد المكونات الرئيسية والثانوية في الهواء والماء التربة.

Textbook: *Author(s), Title, Publisher, Edition, Year, Book website.*

1. COLAIN BAIRD & MICHEAL CANN, Environmental Chemistry, 4th edition, 2002

References: *Author(s), Title, Publisher, Edition, Year, Book website.*

1. J.E. Andrews, P. Brimblecombe, T.D. Jickells, P.S. Liss and B. Reid, An introduction to environmental chemistry, 2nd edition

Course Educational Objectives (CEOs):

1.	Recognize basic concepts, theories, and laws related to Environmental chemistry.
2.	Describe chemical reactions in environment components (atmosphere, hydrosphere, and lithosphere)
3.	Recognize pollution, its sources and remediation.
4.	Recognize analysis of chemicals in environment

Intended Learning Outcomes (ILO's):

	Subject Intended learning outcomes (ILOs) describe what students are expected to know and be able to do at the end of the course. These outcomes are related to the knowledge, skill and competence that students acquire:	**Relationship to CEOs**	**Contribution to PLOs**	**Bloom Taxonomy Levels***	**Descriptors****
A	**Knowledge and Understanding:**				
A1	Student will be able to recognize the concepts, principles, and theories related to environmental chemistry**.**	**1**	**a**	**1**	**K**
B	**Intellectual skills:**				
B1	Student will be able to describe chemical reactions in all environment components (atmosphere, hydrosphere, and lithosphere).	**2**	**b**	**2**	**K**
C	**Subject specific skills:**				
C1	Student will be able to estimate Environmental pollution regarding sources, reactions, and fate.	**3, 4**	**c**	**4**	**C**
D	**Transferable skills:**				
D1	Student will be able to prepare logical and organized oral presentation in topics related to environmental chemistry.	**2, 3, & 4**	**g**	**4**	**S**

***Bloom Taxonomy Levels**

Level #	1	2	3	4	5	6
Level Name	Knowledge	Comprehension	Application	Analysis	Evaluation	Synthesis

** Descriptor (National Qualification Framework Descriptors): K : Knowledge, S: Skill, C: Competency.

Program Learning Outcome (PLOs):

Program Learning Outcomes describe what students are expected to know and be able to do by the time of graduation. These relate to the knowledge, skills, and behaviours that students acquire as they progress through the program. A graduate of the (Bachelor in chemistry) program will demonstrate:		Descriptors**		
		K	S	C
1.	Describe the fundamental scientific principles and theories across the four subfields of chemistry (Organic, inorganic, analytical and physical).	√		
2.	Identify and confirm chemical compounds structures as well as determine chemical composition.	√		
3.	Establish and concludes mechanisms of physical and chemical processes in addition to the ability of mastering qualitative and quantitative determination.			√
4.	Solve the scientific problems using different mechanisms and procedures based on critical thinking.		√	
5.	Conduct scientific experiments in chemistry.			√
6.	Commitment and interest in lifelong learning, and collaborate effectively with other people in a team.			√
7.	Prepare logical, organized and concise written reports, and oral and poster presentations that effectively communicate chemical content to other scientists.		√	
8.	Commitment to the ethical principles of chemical research.			√
9.	Find information about chemistry through databases and information		√	
10.	Evaluation of calculations in chemistry experiments and information analysis using computer software.			√
11.	Demonstrate safety laboratory techniques.		√	

**** Descriptors according to the national qualifications framework (K: knowledge, S: skill, C: Competency)**

Weekly Schedule *(please choose the type of teaching)*

□ Face to Face

√ Hybrid *(**2 Lectures** Face – To - Face **+1 Lecture** Asynchronous)*

□ Hybrid (*1 Lectures* Face – To - Face ***+1 Lecture*** Asynchronous)

□ Online *(**2 Lectures** Synchronous **+1 lecture Asynchronous**)*

Week	First Hour (*Face – To - Face*)	Second Hour (*Face – To - Face*)	Third Hour (***Asynchronous***)	Ach. ILOs	Ach. PLOs	Descriptors*
1	Introduction to Environmental chemistry	Introduction to Environmental chemistry	Introduction to Environmental chemistry	1, 2. 3	a	K

2	Chemistry of atmosphere	Chemistry of atmosphere	Chemistry of atmosphere	1, 2. 3	a,b, c	K, S, C
3	Chemistry of atmosphere	Chemistry of atmosphere	Chemistry of atmosphere	1, 2. 3	a,b, c	K, S, C
4	Chemistry of hydrosphere	Chemistry of hydrosphere	Chemistry of hydrosphere	1, 2. 3	a,b, c	K, S, C
5	Chemistry of hydrosphere	Chemistry of hydrosphere	Chemistry of hydrosphere	1, 2. 3	a,b, c	K, S, C
6	Chemistry of hydrosphere	Chemistry of hydrosphere	Chemistry of hydrosphere	1, 2. 3	a,b, c	K, S, C
7	Chemistry of lithosphere	Chemistry of lithosphere	Chemistry of lithosphere	1, 2. 3	a,b, c	K, S, C
8	Chemistry of lithosphere	Chemistry of lithosphere	Chemistry of lithosphere	1, 2. 3	a,b, c	K, S, C
9	Presentations	Presentations	Presentations	1, 2. 3, 4	a,b, c	K, S, C
10	Final Exam			1, 2. 3, 4	A, b, c, d	K, S, C

* **K: Knowledge, S: Skills, C: Competency**

Teaching Methods and Assignments:

Development of ILOs is promoted through the following teaching and learning methods:

- **Interactive videos**
- **Practice Labs**
- **Discussion Forums**
- **Quizzes**
- **Other Interactive online activities**
- **Reports**

Course Policies:

A- Attendance policies:

The maximum allowed absences is 15% of the lectures.

B- Absences from exams and handing in assignments on time:

Midterm exam can be retaken based on approval of excuse by the instructor's discretion.

Not handing assignment on time will incur penalties.

C- Academic Health and safety procedures

D- Honesty policy regarding cheating, plagiarism, and misbehaviour:

Cheating, plagiarism, misbehaviour will result in zero grade and further disciplinary actions may be taken.

E- Grading policy:

- All homework is to be posted online through the e-learning system.
- Exams will be marked within 72 hours and the marked exam papers will be handed to the students.
- Online Activities (Course Videos, Practice labs, Discussion Forums, Quizzes) **20 %**
- Midterm **30 %**
- Final Exam **50 %**

F- Available university services that support achievement in the course: **E-Learning Platform, Labs, Library.**

Required equipment:

- **PC / Laptop with webcam and mic**
- **Internet Connection**
- **Access to the IU E-Learning Platform at: https://elearn.iu.edu.jo/**
- **E-learning plan**

- Satisfaction questionnaires for online and face-to-face learning
- Software for e-learning
- Training

Assessment Tools implemented in the course:

- √ Final Exam
- √ Midterm Exam
- Quizzes
- √ Homework
- Practice Labs
- Discussion Forums
- Periodic reports for learning assessment
- Improvement plans for online or face-to-face teaching
- √ Others: Oral presentation

Responsible Persons and their Signatures:

Course Coordinator	**Dr. Alaa Al-Ma'abreh**	**Completed Date**	**05/07/2022**
		Signature	Alaa Al-Ma'abreh

Received by (Department Head)		**Received Date**	**05/07/2022**
		Signature