Course Specifications

Course Title:	**Environmental Pollution**
Course Code:	**4014191-2**
Program:	**General Biology**
Department:	**Department of biology**
College:	**Faculty of Applied Science**
Institution:	**Um Al-Qura University**

Table of Contents

A. Course Identification

1. Credit hours:	**2 hours.**

2. Course type

a.   University ☐   College ☐   Department ☑   Others ☐

b.   Required ☑   Elective ☐

3. Level/year at which this course is offered: **4th Year / Level 7.**

4. Pre-requisites for this course (if any)**: Animal Ecology (4013352-3).**

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

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	30	50
2	Blended	-	-
3	E-learning	-	-
4	Correspondence	-	-
5	Other	30	50

7. Actual Learning Hours (based on academic semester)

No	Activity	Learning Hours
Contact Hours		
1	Lecture	30
2	Laboratory/Studio	-
3	Tutorial	-
4	Others (specify)	30
	Total	60
Other Learning Hours*		
1	Study	30
2	Assignments	8
3	Library	10
4	Projects/Research Essays/Theses	10
5	Others (specify)	-
	Total	58

* The length of time that a learner takes to complete learning activities that lead to achievement of course learning outcomes, such as study time, homework assignments, projects, preparing presentations, library times

B. Course Objectives and Learning Outcomes

1. Course Description

The course deals with the definition of pollution and pollutants, principles of environmental pollution and its relationship to the ecosystem, types of air, water, soil and food pollution, physical contaminants (heat, noise and radiation), ways of pollutant control, biological effects of pollutants; global and local pollutions. In addition to practical work, two field trips (on 4th and 8th week ends) will be applied. This course is designed to study types of pollutants including gases, chemicals petroleum, noise, light, global warming and radiation as well as pollutant flow and recycling, principles of environmental pollution such as air, water and soil, in addition to environmental factors and interactions between pollutants and their hazards on different ecosystems, population dynamics in different polluted ecosystems such as, waste dumps regions and sewage or industrial waste regions, desalination stations and drainage areas of sewage in to the Red Sea, and safe disposal of pollutants. After completing the course the student should be able to:

- Understand major concepts and terminology in the field of environmental pollutants, its interconnections and direct damage to the wildlife, in addition to, human communities and ecosystems.
- Understand and investigate how empirical evidence supports to refute or to control the environmental problems especially disasters.

2. Course Main Objective

After completing this course, students should be able to:

- The course will provide students with an understanding and appreciation of the complex interactions of man, health, and the environment. It will expose students to the multi-disciplinary nature of environmental health sciences; the information and tools required to assess environmental quality as it relates to human and ecosystem health. The negative impacts of environmental degradation can have on human, wildlife and other bioreceptors in aquatic and terrestrial ecosystems; and the control measures required to minimize, manage and/or eliminate specific environmental problems.
- The course will address environmental stressors and pollution, their sources in the natural and workplace environments, their modes of transport and transformation, their ecological and public health effects, and existing methods for environmental disease prevention and remediation.
- Apply field and practical applications.

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge:**	
1.1	Identify the Types of pollutants in addition, air, water, soil pollution.	
1.2	Employ recent communication and information technologies effectively in different tasks related to environmental pollution.	
1.3	Learn methods to measure and analyze the published data concerned with pollution.	
1.4	Distinguish the effect of pollutants on human health, economy and wild environments. Then Be aware about the proper and applied ways deal with the pollution cases in local environments.	

	CLOs	Aligned PLOs
1.5	**Be able to clearly and concisely speak about and write about the relationships between increase pollution levels and general health. Then, writing proposals (as a presentation) for issuing industrial permits for projects compliant with international standards to combat environmental pollution while stopping industrial activity and applying deterrent penalties for violating factories.**	
1.6	**Learn how to study local sever cases and write report to solve the effect of pollution effects. Then, write about the recommended methods to replace pollutants by using alternative material and recent techniques, such as 1- Usage bioinsecticides and biological control instead of traditional insecticides. 2- Relying on renewable energy sources (solar, wind energy) and other alternative energy sources instead of traditional**	
1.7	**Draw a statistical curves or histograms to indicate pollutant levels, their effects of them on human population and human activities in local of the surrounding regions.**	
1.8	**Comprehend the methods and applications to measure or detect pollutants, economic and health hazards. Then, write the recommended methods to improve air and water sources, moreover, to prevent hazards on human health, livestock production and economic loss.**	
1.9	**Enumerate the national and international data deal with environmental pollution. Then, write the recommended methods to use non-polluting sources of energy to the environment.**	
2	**Skills:**	
2.1	**Using the published knowledge to diagnose the pollution levels in national in comparison with that of international environments. Then make a team presentation discuss pollution in KSA and review efforts to minimize the negative health and economic impacts of the spread of pollutants.**	
2.2	**Identify pollutants, sources, and vision to reduce their negative effects.**	
2.3	**Distinguish the common sources and hazards of pollutants such as radiation, chemicals and heavy metals, emissions of gases, insecticides, industrial agricultural and human wastes.**	
2.4	**Design a histogram illustrate the national pollutant concentration distribution and their hazards.**	
2.5	**Apply a strategy to team study for individual pollutant as a recommendation study.**	
2.6	**Employ recent communication and information technologies effectively to investigate pollution in Makkah regions.**	
2.7	**Discuss the data collected from countries of Meddle East in comparison with that in the developing countries.**	
2.8	**Team work activities: Field work as a presentation activity.**	
2.9	**Use the personal skills, tools to collect pollution data from media, field and other sources to make good presentation.**	

	CLOs	Aligned PLOs
3	**Competence:**	
3.1	**Developing oral presentations and leader ship activity**	
3.2	**Communicating personal ideas and thoughts**	
3.3	**Work independently, Self-learning and as part of a team,**	
3.4	**To apply, describe, discuss, or contribute reports.**	

C. Course Content

No	List of Topics (16 weeks)	Contact Hours
1	**The concept of the environment and the introduction of environmental regulations and the impact of human.**	**2**
2	**Water resources and pollution of different types of pollution (industrial - agricultural- thermal- sewage), and use of micro-organisms as evidence of pollution.**	**2**
3	**Poisoning water bodies due to flourishing of toxic algae species and its impact on human and animal. Underground water pollution.**	**2**
4	**Water pollution: with oil residues and heavy metals and the bioaccumulation phenomenon.**	**2**
5	**Water pollution: petroleum pollution of marine and freshwater environments**	**2**
6	**Practical Med term Exam.** **Written Med term Exam.**	**2**
7	**Atmosphere (air pollution, acid rain and damages, the erosion of the ozone layer, global warming).**	**2**
	Soil pollution: chemical sources, effects and solutions.	**2**
8	**Soil pollution: insecticides sources, effects and solutions.**	**2**
9	**Pharmaceutical pollutants, cosmetics, personal hygiene and its impact on the environment and ways of safe disposal.**	**2**
10	**Medical and pathological wastes, the proper way of getting rid of it.**	**2**
11	**Food sources in the world and the problems of food contamination and ways to solve them.**	**2**
12	**Noise and light pollution**	**2**
13	**Discussion of student's reports or presentation on different environmental problems.**	**2**
14	**Continue the discussion of student's reports on different environmental problems.**	**2**
15	**Revision**	**2**
16	**Final exam.**	
	Total	**30**

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge**		

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
2.1	**Identify the Types of pollutants in addition, air, water, soil pollution.**		
2.2	**Employ recent communication and information technologies effectively in different tasks related to environmental pollution.**		
2.3	**Learn methods to measure and analyze the published data concerned with pollution.**		
2.4	**Distinguish the effect of pollutants on human health, economy and wild environments. Then Be aware about the proper and applied ways deal with the pollution cases in local environments.**		
2.5	**Be able to clearly and concisely speak about and write about the relationships between increase pollution levels and general health. Then, writing proposals (as a presentation) for issuing industrial permits for projects compliant with international standards to combat environmental pollution while stopping industrial activity and applying deterrent penalties for violating factories.**	1. Lectures and student research papers. 2. The using of visual display such as PowerPoint. 3. Homework assignments. Discussions (connecting what they learn in the class and applying this information in laboratory).	- **Homework and Quizzes.** - **Midterm and final written exams.** - **Evaluation of reports.** - **Group discussions and participation in the lecture.** **Course work reports.**
2.6	**Learn how to study local sever cases and write report to solve the effect of pollution effects. Then, write about the recommended methods to replace pollutants by using alternative material and recent techniques, such as 1- Usage bioinsecticides and biological control instead of traditional insecticides. 2- Relying on renewable energy sources (solar, wind energy) and other alternative energy sources instead of traditional**		
2.7	**Draw a statistical curves or histograms to indicate pollutant levels, their effects of them on human population and human activities in local of the surrounding regions.**		
2.8	**Comprehend the methods and applications to measure or detect pollutants, economic and health**		

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
	hazards. Then, write the recommended methods to improve air and water sources, moreover, to prevent hazards on human health, livestock production and economic loss.		
2.9	Enumerate the national and international data deal with environmental pollution. Then, write the recommended methods to use non-polluting sources of energy to the environment.		
2.0	**Skills**		
2.1	Define the concept and basses used to determine pollutants and their hazards and negative effects of human health.		
2.2	List of pollutants of different polluted localities and record proposals from workers and employers in these localities to solve or reduce pollution hazards. These data can be summarized in a presentation.	1. Interactive lectures. 2. Seminars. 3. Participation of students in discussions during the lecture. 4. Trying to explain the issues in regular and motivated manner. Follow up the students in lab and during carryout all analytical techniques.	- Exam must contain questions that can measure these skills. - Quiz and exams. - Discussions after the lecture. Practical exam.
2.3	Team work activities to make field study. In order to present the relationships between increase pollution levels general health and economic loss.		
2.4	Photographs for water and soil samples from different polluted localities to prepare a team presentation in order to illustrate their hazard effects on the surrounding environments.		
2.5	Read any available references deals with industrial, trashed and sewage regions; common the site selling vegetables and fish to know more details about different pollution levels.		
3.0	**Competence**		
3.1	Personal leader ship activity.	• Oral presentations.	- Evaluation of student essays and assignments.
3.2	Self-learning in teamwork.		
…	Reports and presentations		

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
		• Internet search assignments and essays. • Incorporating the use and utilization of computer in the course requirements.	- Marks given to for good reports and presentations. Evaluating during the discussion in lecture and reports. Part of the grad is put for student's written participation.

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Periodical Exam(s)	4	10 %
2	Mid Term Exam (Theoretic)	8	20 %
3	Mid Term Exam (practical)	9	10 %
4	Reports and essay	11	5 %
5	Final Practical Exam	15	15 %
6	Final Exam	16	40 %
	Total		**100 %**

Assessment task (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

2 Office hours/week

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	Friis, Robert H. Essentials of Environmental Health. Jones and Bartlett, Inc., Sudbury, MA. ISBN No. 0-7637-4762-9. Staff lecture notes
Essential References Materials	Hill, Marquita K., Understanding Environmental Pollution, 2nd Edition. Cambridge University Press, Cambridge, UK. ISBN No. 0-5218-2024-3.
Electronic Materials	https://en.wikipedia.org/wiki/Pollution http://www.worldbank.org/en/programs/pollution-management-and-environmental-health-program https://www.birmingham.ac.uk/schools/gees/courses/undergraduate/modules/geography-and-planning/environmental-pollution.aspx
Other Learning Materials	CD prepared by the staff members containing U-tube videos. Multi- media associated with the text book and the relevant websites. Biological charts.

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	The areas of class rooms are suitable, concerning the number of enrolled students; and air conditioned. Lecture room equipped with a black board and Data show. Instructors use their own laptop. Ecology lab well equipped.
Technology Resources (AV, data show, Smart Board, software, etc.)	Class rooms are already provided with data show, audio-visual equipment.
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	Laboratory instruments for measuring some ecological parameters.

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Student Feedback on Effectiveness of Teaching	**Students.**	**Class room discussions. Questionnaires.**
Evaluation of Teaching	**Instructor or by the Department**	**Revision of student answer paper by another staff member.** **Analysis the grades of students.**

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	Prof. Adnan Mohamed Hijji; Prof. Osama Mohamed Sarhan	
Reference No.		
Date	21/11/2019	