Course Specifications

Course Title:	**Pollution and Ecotoxicology**
Course Code:	**314BIO-3**
Program:	**Biology**
Department:	**Biology**
College:	**College of Arts and Sciences**
Institution:	**Najran University**

Table of Contents

A. Course Identification

1. Credit hours:2
2. Course type **a.** University ☐ College ☐ Department ☒ Others ☐ **b.** Required ☒ Elective ☐
3. Level/year at which this course is offered: VI/ 3rd year
4. Pre-requisites for this course (if any)**: 211BIO-2**
5. Co-requisites for this course (if any)**: non**

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	45	100%
2	**Blended**		
3	**E-learning**		
4	**Correspondence**		
5	**Other**	-	

7. Actual Learning Hours (based on academic semester)

No	Activity	Learning Hours
Contact Hours		
1	**Lecture**	45
2	**Laboratory/Studio**	-
3	**Tutorial**	-
4	**Others** (specify) E-learning	
	Total	45
Other Learning Hours*		
1	**Study**	27
2	**Assignments**	3
3	**Library**	10
4	**Projects/Research Essays/Theses**	5
5	**Others** (specify) **: Office hours**	10
	Total	55

* 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 aimed to illustrate the nature of pollution and its causes. The correct ways to prevent dangerous and learn safe roads in dealing with the wastes of different kinds of pollutants. Identifying echo-friendly materials used in various fields of life to protect human and the environment and maintaining. This course aims to enable students to understand environmental problems, looking at causal linkages between pollution sources, exposure pathways and impacts to environmental quality and human health. Knowledge of laws and regulations that govern the relationship between man and the environment are also provided.

2. Course Main Objective

1. Recognize the correct definition of pollution and causes and types of pollution.
2. Describe the causatives of water, soil and air pollution.
3. Enumerate the causes and effects of food contamination.
4. Evaluate the impacts of human activities on ecological systems and processes.
5. Assess and contrast threatening processes to global biodiversity.
6. Evaluate current and potential conservation problems in their region.
7. Suggest solutions for pollution problems and ways to reduce pollutants
8. Critically analyze ecological information and data to provide informed decision-making in relation to resource management.

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	**Knowledge:**	
1.1	Recognize the correct definition of pollution and causes and types of pollution.	
1.2	Know the causatives of water, soil and air pollution.	
1.3	Enumerate the causes and effects of food contamination.	
2	**Skills :**	
2.1	Evaluate the impacts of human activities on ecological systems and processes.	
2.2	Assess and contrast threatening processes to global biodiversity.	
2.3	Evaluate current and potential conservation problems in their region.	
3	**Competence:**	
3.1	Work independently and as a team work	
3.2	Suggest solutions for pollution problems and ways to reduce pollutants	
3.3	Critically analyze ecological information and data to provide informed decision-making in relation to resource management.	

C. Course Content

No	List of Topics	Contact Hours
1	Global ecosystems, how they work and the role of natural systems as the foundation for understanding environmental pollution and protection.	3
2	Introduction about the hazards caused by pollution and its relation to ecosystem, plant, animals and human health, Identification of pollution, types of pollutants.	3
3	Soil pollution in its various forms, including agricultural practices, hazardous waste materials and pest management, and their impacts upon ecosystem and human health.	6
4	Air pollution: types, causatives and effects. Air Quality and Health	6
5	Water pollution, Water Quality and Health	6
6	Food pollution, (food spoilage and microbial pollution) types, its causatives and effects.	3
7	Radiation pollution, types, causatives and effects, environmental organic chemicals and health, oionizing and non-ionizing radiation.	3
8	Environmental Toxicology, toxic Metals and Elements.	6

	Hazardous Materials Management and Disposal, environmental Health Sciences and Disease Understanding, occupational Health and Industrial Hygiene	
9	Pollution and Global Change, environmental Diseases	3
10	Environmental Policies to Protect Human Health. Rules regulating pollution and pollutants in KSA and all over the world.	6
Total		45

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:**		
1.1	Recognize the correct definition of pollution and causes and types of pollution.	**Lectures**	Final and semester exams
1.2	Describe the causatives of water, soil and air pollution.	**Lectures**	Final and semester exams
1.3	Enumerate the causes and effects of food contamination.	**Lectures**	Final and semester exams
2.0	**Skills :**		
2.1	Evaluate the impacts of human activities on ecological systems and processes.	Student negotiations	Class room activity
2.2	Assess and contrast threatening processes to global biodiversity.	Student negotiations	Class room activity
2.3	Evaluate current and potential conservation problems in their region.	Student negotiations	Class room activity
3.0	**Competence:**		
3.1	Work independently and as a team work	Student negotiations	Class room activity
3.2	Suggest solutions for pollution problems and ways to reduce pollutants	Student negotiations	Class room activity
3.3	Critically analyze ecological information and data to provide informed decision-making in relation to resource management.	Student negotiations	Class room activity

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Theoretical First Exam	7	20%
2	Theoretical Second Exam	12	20%
3	Assays , oral presentations	continuous	10%
4	Theoretical Final Exam	15	50%

***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 :

- 10 hours per week as office hours
- Academic advisor 10 hours per week

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	Hill, M.K. Understanding Environmental Pollution: A Primer, 3rd edition. Cambridge University Press. Amazon.com. 2010. Berthouex P. M., Brown L. C. Pollution Prevention and Control: Part I Human Health and Environmental Quality. Bookboon.com. pp. 243., 2014 Cheremisinoff N. P. Handbook of Air Pollution Prevention and Control. Elsevier Publishing group. 2002, ISBN: 978-0-7506-7499-7
Essential References Materials	Michael R. G. Environmental Policy Analysis and Practice Rutgers University Press, 2007 Ross B. and Amter S. The Polluters: The Making of Our Chemically Altered Environment. Oxford University Press, 2010 Harrison R. M. Pollution: Causes, Effects and Control. Royal Society of Chemistry. Amazon.com.2001.
Electronic Materials	http://tocs.ulb.tu-darmstadt.de/20381309X.pdf http://www.sciencedirect.com/science/book/9780750698993 https://www.questia.com/article/1G1-280406027/who-air-pollution-a-continuing-health-threat-in-world-s https://www.questia.com/article/1G1-248265187/from-good-intentions-to-proven-interventions-effectiveness https://www.questia.com/library/120076659/the-polluters-the-making-of-our-chemically-altered
Other Learning Materials	Learning flashes, Cds, videos.

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) 40 seats/ class room Computer access with data show and internet
Technology Resources (AV, data show, Smart Board, software, etc.)	Data show, Overhead projector
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	Models Microscopes

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Course evaluation	Student	direct
Student-faculty meeting	Faculty, Program Leaders	indirect
Departmental council discussions	Staff members	indirect
Discussion with the group of faculty teaching the same course	Peer Reviewer	indirect
Periodical departmental revisions of each method of teaching	Peer Reviewer	indirect

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	
Reference No.	
Date	