

MARINE ENVIRONMENT POLLUTION

Course Information and Syllabus

Instructor:

Dr. Mohammad Al-Zibdah

Lecture time and location:

Monday-Wednesday, 8:00 am – 9:30 am

Office and contact information: Faculty of Marine Sciences office

Phone, 2090450/35075

e-mail: zibdeh@ju.edu.jo

Office hours:

Sunday/Tuesday/Thursday 11-12 am, or by appointment

Course Description and Purpose

This is a reading-intensive course designed for advanced undergraduate students interested in environmental marine pollution. The objective of the course is for students to understand marine pollution (theory and practice), the potential environmental impacts on people and economy. General principles and practices will be covered first, followed by lectures on specific topics on individual pollutants that affect the marine environment. Lecture outlines will be based primarily but not exclusively on the content of a class textbook (additional **readings are required**). Students will be expected to independently study all required readings. Optional extra credit will be available. Students enrolling in this course are expected to have prior knowledge of basic biology and chemistry and ecology.

Expected Learning Outcomes

Upon completion of this course, it is anticipated that students will have an understanding of:

1. The history and concept of marine pollution and its future outlook;
2. The principles of marine pollution
3. The important and sensitive areas that is most vulnerable to marine pollution
4. The general concepts understanding pollution and its prevention and
5. The environmental and ecological concerns associated with marine pollution.

Assessment of Learning Outcomes

Learning outcomes will be assessed through Graded Exams and Pop Quizzes. The final exam will contain selected questions repeated from the midterm exams (see **Grading**), and the grade differential for these repeat questions will also be used as measure of overall learning progress.

Attendance

Class attendance will be recorded and may will count towards grade. However, regular attendance is critical to the learning success of students. In addition, graded quizzes will not be announced and if a student misses lectures where quizzes are given, he/she will earn 0 points for each missed quiz (see **Grading**). Therefore, students are strongly advised to attend all lectures. Make-up exams or quizzes may be given for absences due to medical reasons, but only if a signed physician's note is provided on official stationary that includes the physician's contact information. Make-up exams or quizzes may also be given for absences due to extraordinary nonmedical reasons (e.g., scheduling conflicts with other class field trips, etc.), but

only if the student lets the instructor know of the anticipated absence in advance and provides adequate proof of the scheduling conflict.

In the event the instructor is late to class without prior notice, students should wait a minimum of 10 minutes before leaving the classroom.

It is the responsibility of students who miss any lectures to ensure that they have knowledge of the material covered during the missed lectures and of all assigned readings. Office hours will not be used to re-teach the content of missed lectures.

Grading

There will be two written exams (one midterms and one final). The final exam will be comprehensive and will consist of 50% material from the first term, and 50% from the last term. Exams will worth a total of 80 % exam points.

At least five pop quizzes will be given over the semester to worth points of a total of 10 points, contributions and active participation of 10 points.

Extra Credit

Students will be offered the opportunity of brief, individual meetings with instructor within the first 3 weeks of the first day of classes to discuss student and instructor expectations. A 2.5-point extra credit over the final grade will be given to students who chose this voluntary option.

Course Outline

Chapt.1 W1-2	Marine Pollution - Marine pollution: A definition - Main types of marine pollution in coastal waters - Human Effects on the Marine Environment - Characteristics of Pollution - Biodegradeable vs. Inert Toxic Substances - Using Organisms to Monitor Pollution
Chapt.2 W3-4	Marine Debris - Background - The “garbage patch,” - Plastic in the marine environment - Prediction of Marine Debris Drifting - Impacts of Marine Debris on Marine Life - Impacts of marine litter on human - Marine Debris Research, Prevention, and Reduction
Chapt.3 W5-6	Ocean Acidification - The ocean is a carbon sink - Carbon dioxide in the ocean - Humans affect the amount of CO ₂ in the ocean - How is marine life affected?
Chapt.4 W6-7	Heavy Metals in marine environment - What is contamination? - Measuring contamination? - Heavy metal pollution - Bioaccumulation and Bio-magnification - Sources of heavy metal pollution - Toxic effects of mercury, cadmium and others
Chapt.5	- Eutrophication

W8	<ul style="list-style-type: none"> - What is eutrophication? - Causes of Eutrophication - Environmental Impacts of Eutrophication - Socio-economic Consequences of Eutrophication - Remediation Measures
Chapt.6 W8-9	<p>Toxic Chemicals and Toxins</p> <ul style="list-style-type: none"> - Polycyclic Aromatic Hydrocarbons - Effects of PAHs on marine organisms - Halogenated Hydrocarbons - Radioactive Substances
Week 9	- Mid term exam
Chapt.7 W10-11	<p>Anoxic waters</p> <ul style="list-style-type: none"> - Causes and effects - Anoxic basins - Aquatic toxicology - Cyanotoxins - Harmful algal blooms - Cyclic peptides - AI kaloids - Saxitoxin - Lipopolysaccharides
Chapt.8 W12-13	<ul style="list-style-type: none"> - Oil Pollution (Oil spills) - Oil spills- Sources of oil pollution - Environmental effects - Cleanup and recovery - Prevention - Environmental Sensitivity Index (ESI) mapping
Chapt.9 W14	<p>Thermal Pollution</p> <ul style="list-style-type: none"> - What is Thermal Pollution? - Thermal Effluents - Major Causes - Effects of Increased Water Temperature - Biotic Effects of Thermal Pollution - Remediation and prevention measure for thermal pollution
Chapt.10 W15	<p>Environmental pollution of nuclear power plants</p> <ul style="list-style-type: none"> - Release of radioactive particles - Radioactive isotopes pollution - The treat of nuclear accidents
Review and presentations for all topics W16	Student participation and group discussions

Final Exam – to be determined

Revisions to this schedule are possible depending on progress. Any changes made would be discussed in class.

Other information

1. The Department, College, and University endorse UJ Aqaba branch regulations. Students with disabilities are encouraged to inform the faculty member so that any needed help can be provided. An effort will be made to maintain confidentiality. Any student who requires special arrangements in order to meet the course requirements should contact the instructor to make necessary arrangements.
2. The office of department chair is available to assist students with any conflict or problem that has to do with being a student at Aqaba Jordan University. You may visit the chair person in his office at the office hours or by appointment.
3. Professional maturity and familiarity with ethical standards are taken for students attending the University. They are expected to behave professionally and respectfully toward student colleagues and the class instructor and to assist in maintaining a classroom environment which is conducive to learning. In order to assure that all students have an opportunity to learn from time spent in class, students are prohibited from using cellular phones or beepers, eating or drinking in class, making offensive remarks, reading newspapers, sleeping or engaging in any other form of distraction. Inappropriate behavior in the classroom shall result in, minimally, a request to leave classroom. The university policy on the classroom environment should be known to all students.
4. Because of professional obligations, the instructor may be required to travel out of town occasionally. When possible, guest lecturers will be invited to cover the scheduled lecture materials (or other topics) during the instructor's absence. Guest lecture contents may be included in the tests.