

Course Syllabus**Instructor:**

Dr. Jeremiah K.N. Mbindyo

Office: Caputo 321

Email: Jmbindyo@millersville.edu

Office hours: M, W 10 a.m.- 12:00 noon; F 10:00-11:00 a.m. (Other times can be scheduled by arrangement by email).

Class hours: Lecture: M, W, F 9-9:50 a.m.

Venue: CAP 211

Required materials:

Text: Environmental Chemistry by Colin Baird, 5th edition. (ISBN-13: 978-1429277044).

Additional reading materials to be assigned in class.

Course Description:

This course is a study of the foundational principles of Environmental Chemistry and Sustainability. It meets the university requirements of a "D" course. Catalog Description: CHEM 375: 4 s.h. Environmental Chemistry (D, G2). The application of modern chemical principles to the chemical and physical interactions among the hydrosphere, lithosphere, atmosphere and biosphere. Also discussed are the more recent topics in the areas of pollution, energy and waste control. (The laboratory covers the current, fundamental instrumental methods and techniques encountered in environmental analysis.) 3 hrs. lec., 3 hrs. lab. Offered in fall. Prereq: CHEM 112 with a grade of C- or higher; C or higher for Chemistry majors.

Course Learning Objectives

By the end of the course, you should be able to:

- Explain the terms environmental chemistry, green chemistry and sustainability and how they are interrelated.
- Identify the major sources of chemicals introduced into the environment and describe their reactivity and eventual fate.
- Describe the chemical processes involved in water and waste water treatment.
- Describe the effects of organic and inorganic pollutants on health.
- Explain the atmospheric chemical processes that lead to acid rain and photochemical smog.
- Discuss and demonstrate an understanding of Global Climate Change.
- Demonstrate an understanding of the major sources of energy and describe examples of sustainable and renewable sources of energy.
- Describe how environmental issues relate to and impact various aspects of culture and social justice.

Environmental issues will be discussed from a chemistry perspective. Case studies of environmental problems as social justice issues will be drawn from the US and around the world. You are encouraged to share your own experiences and views about the issues discussed in class.

Course format:

The course format consists of three 50 minute lectures/discussions per week. You are expected to attend all classes and to participate and contribute to discussions. In case of a planned unavoidable absence, you should notify me in advance, preferably in person or by email. It is your responsibility to make up any work missed when you were absent. You should also pick up any handouts, tests, assignments etc. that were passed out during your absence from my office during office hours. In the event of unforeseen circumstances, you should email before the end of the class period if possible in order for the absence to be considered excused.

Course Grades

Course grades will be based on in class quizzes, 3 hour exams, laboratory grade and a final exam.

Assignments/presentations	20 %
Hour exams	30 %
Lab	20 %
Participation	5 %
Final Exam	25 %

Grade Distribution

A	B	C	D	F
A 90-100%	B ⁺ 85-87%	C ⁺ 74-77%	D ⁺ 66-67%	< 60%
A ⁻ 88-89%	B 80-84%	C 70-73%	D 64-65%	
	B ⁻ 78-79%	C ⁻ 68-69%	D ⁻ 60-63	

Tentative of Topics

Week	Date	Topic	Chapter	Comments
I - INTRODUCTION, TOXIC INORGANIC SUBSTANCES AND WATER TREATMENT				
1.	8/25-29	Introduction	Intro	
2.	8/30-9/5	Toxic Heavy Metals	12	
3.	9/8-12	Water and wastewater treatment	11	
II - TOXIC ORGANIC COMPOUNDS				
4.	9/15-19	Pesticides	13	
5.	9/22-26	Dioxins, Furans and PCBs	14	Exam 1 (9-26)
6.	9/29-10/3	Environmental Estrogens	15	
III - AIR POLLUTION AND ATMOSPHERIC PROCESSES				
7.	10/6-10	Stratospheric Ozone	1	
Mon-Tue 10/13,14 – Fall Break				
8.	10/13-17	The ozone holes	2	Exam 2 (10/17)
9.	10/20-24	Ground level air pollution	3	
IV - CASE STUDIES				
10.	10/27-10/31	Case Studies/presentations	-	
11.	11/3-11/7	Air Pollution and Health	4	
V - ENERGY SOURCES AND GREENHOUSE EFFECT				
12.	11/10-14	The Greenhouse <i>effect</i>	5	Exam 3 (11/14)
13.	11/17-21	Climate Change	6	
14.	11/24-28	Renewable energy I	7	
11/26-28 Thanksgiving break				
15.	12/1-12/5	Renewable energy II / Final Exam	8	
16.	12/8-12/12	Renewable energy II / Final Exam	8	Final Exam (12/10)
Final Exam Wed Dec 10 – 8-10 a.m.				

University Class Attendance Policy

The University supports departmental and faculty class attendance policies that are reflective of and consistent with University approved guidelines. Faculty will include their class attendance policy in their syllabi given to all students in their classes at the start of the semester.

University approved guidelines:

1. **Students are expected to attend all classes.** It is the student's responsibility to complete all course requirements even if a class is missed. If a student misses class for an officially excused reason, then he/she is entitled to make up the missed work but only at the convenience of the faculty member. Responsibility for materials presented in, assignments made for, and tests/quizzes given in regularly scheduled classes lies solely with the student.
2. **The University policy is that faculty will excuse absences for the following reasons:**
a. personal illness, b. death or critical illness in the family, c. participation in a university-sponsored activity, d. jury duty e. military duties, or f. religious holidays.

Faculty judge the validity of student absences from class within the University's approved guidelines and may require documentation for excused absences. Faculty will evaluate any reason, other than those listed above, for a student missing class and determine whether the absence is justified. In these circumstances, a student may make up missed work at the discretion of the instructor.

3. **In the case of foreseeable absences, students are encouraged to notify the faculty member in advance.** A student who will miss class due to participation in an official University activity must notify the instructor well in advance of the activity to assure that the absence is excused.

Title IX Statement

Millersville University and its faculty are committed to assuring a safe and productive educational environment for all students. In order to meet this commitment and to comply with Title IX of the Education Amendments of 1972 and guidance from the Office for Civil Rights, Title IX requires University faculty members to report incidents of sexual discrimination, including sexual violence, shared by students to the University's Title IX Coordinator. Accordingly, if a student shares information about any incidents of sexual discrimination or sexual violence during a classroom discussion, in a writing assignment for a class, or in other contexts, faculty must report that information to the Title IX Coordinator. This information will only be shared with the Title IX Coordinator, who is the individual on campus designated to respond to reports of discrimination or sexual violence. While the Title IX Coordinator is not a confidential source of support, they will address matters reported to them with sensitivity and will keep your information as private as possible.

Additionally, faculty members are obligated to report sexual violence or any other abuse of a student who was, or is a child (a person under 18 years of age) when the abuse allegedly occurred, to the person designated in the University's [Protection of Minors policy](#).

Information regarding the reporting of sexual violence and the resources that are available to victims of sexual violence is set forth at: www.millersville.edu/titleix

Millersville University Policies

1. Academic Honesty Policy link [Governance Manual \(millersville.edu\)](#); for additional information please see the following: [What is Academic Integrity? | Millersville University](#)
2. Attendance Policy link: [Class Attendance Policy | Millersville University](#)
3. Inclusion Statement: [Millersville University Inclusion Statement | Millersville University](#)
4. Land Acknowledgement: [Land Acknowledgement | Millersville University](#)
5. Policy on Delays and Cancellations link [Policy on Delays & Cancellations | Millersville University](#)
6. Chosen Name FAQs link [Preferred Name FAQs | Millersville University](#)
7. Privacy Rights under FERPA link [Annual Notification of Student Rights Under FERPA | Millersville University](#)
8. Student Conduct and Community Standards Handbook link [studentcodeofconduct.pdf \(millersville.edu\)](#)