

UMBC
Department of Chemical, Biochemical, and Environmental Engineering
ENCH 210 Introduction to Environmental Engineering

Spring 2023
Course Syllabus

Instructor

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Office Hours: Tu, Th 11:15 am – 12:30 pm, or by appointment (preferred), TRC 102 or TRC 149 or online/phone

Class Meeting Time: T, Th 10:00 – 11:15 AM

Class Meeting Location: TRC Room 122

Required Text

Masters, G. M., and Ela, W. P., *Introduction to Environmental Engineering and Science* (3rd Ed), Pearson Education, NJ.

Course handouts must be used to take notes on and to follow the lecture. These will be posted as pdf files. You can take notes on them either electronically with a stylus, or print them out and put in a notebook and take notes manually.

Grading 10% quizzes, 5% lightning talk + writeup; 20% problem sets, 20% Exam 1, 20% Exam 2, 25% Final

Grading scale: 90% – 100% A
80% – 89% B
70% – 79% C
60% – 69% D
< 60% F

Grades may be adjusted up at the end of the semester depending on course outcomes but will not be adjusted down.

Problem Sets

Due in class per deadlines. *No late assignments will be accepted. Emailed homework assignments will not be accepted.*

For problem sets, students are encouraged to work together on clarification of concepts, but each student is responsible for independent problem solving and turning in his/her/their own work that is his/her/their own. Duplicating or copying another student's work is prohibited and will be assigned a grade of zero. Copying from the internet is not acceptable. You can contact C. Welty by email for clarification on questions or other help. C. Welty will be grading homework. Plagiarized work will be given a score of zero.

Guidelines for formatting problem sets are posted on BlackBoard and are to be followed. See sample solved problem posted in BlackBoard for level of detail expected.

Problem sets must be done on 8½" x11" engineering paper. Engineering paper can be printed on the reverse side of 8½" x11" recycled office paper or junk mail, using online templates. Example templates are posted on BlackBoard. **Unacceptable: Any paper other than engineering paper.**

Work must be tidy. Points will be taken off for sloppy work. All work must be shown. No partial

credit will be given for wrong answers if calculations are not shown.

Rules regarding significant figures are to be followed. Points will be taken off of homework and exams if rules are not followed. (See for example <http://www.astro.yale.edu/astro120/SigFig.pdf>)

Problem sets that do not include required information or follow the required format posted on BlackBoard will be returned without grading and a grade of zero will be recorded.

Quizzes: 10-minute quizzes will be given approximately weekly to test on course concepts, at the end of class.

City Applications. Lightning talks (5 minutes per student, using PowerPoint) and ~5-page single-spaced write-up on parameters and design elements of water and wastewater treatment facilities, plus implementation of renewable energy policies, for city of your choice anywhere in the world, where information is obtainable. City choices must be approved by C. Welty and there are not to be duplicates. First come, first served on getting your first choice. Submit your chosen city to C. Welty by email; submissions will be sorted by email timestamps. Duplicates will be notified ASAP for resubmission.

Field Trip: A class field trip to a stream restoration site during the class period will be conducted. The field site is in Catonsville.

Exams: Two 75-minute in-class exams will be given. The exams will be closed-book, and will not be cumulative. Formula sheets will be provided. Tentative exam dates are **Mar.9** and **Apr. 13**. Make-up exams will not be offered unless there is a documented emergency. The final exam will be cumulative, and will be given on **May 23** from 10:30 am - 12:30 pm (date and time to be confirmed after posting by registrar).

UMBC Statement of Values for Academic Integrity

Academic integrity is an important value at UMBC. By enrolling in this course, each student assumes the responsibilities of an active participant in UMBC's scholarly community in which everyone's academic work and behavior are held to the highest standards of honesty. Cheating, fabrication, plagiarism, and helping others to commit these acts are all forms of academic dishonesty, and they are wrong. Academic misconduct could result in disciplinary action that may include, but is not limited to, suspension or dismissal

Course Objectives At the conclusion of the course, students should be able to:

- (1) Describe the activities of Environmental Engineers across the broad areas in which they work.
- (2) Describe the sources, transformations, and environmental impacts of major pollutants. From this, students will develop an understanding of the influence that human activities have on the environment.
- (3) Design environmental engineering systems to solve problems by applying fundamental concepts of engineering, chemistry, physics, and biology.

Tentative course schedule (subject to change)

Day	Date	Lecture	Topic	Reading	Assignments
Tues	Jan 31	1	Syllabus + Overview start	Posted readings	
Thur	Feb 2	2	Overview finish; Units start	Ch 1	
Tues	Feb 7	3	Units finish; Mass balance start	Ch 1	Quiz 1
Thur	Feb 9	4	Mass balances	Ch 5	PS1 due
Tues	Feb 14	5	Mass balances; Water pollution	Ch 5	Quiz 2
Thur	Feb 16	6	Water pollution	Ch 5	PS2 due
Tues	Feb 21	7	Water pollution; BOD	Ch 5	Quiz 3
Thur	Feb 23	8	BOD; DO sag	Ch 5	Assignment 3 due
Tues	Feb 28	9	BOD; DO sag Start water quality control	Ch 5	Quiz 4
Thur	Mar 2	10	Water treatment: sedimentation; coagulation & flocculation	Ch 6	PS4 due
Tues	Mar 7	11	Water treatment: filtration, disinfection	Ch 6	Quiz 5
Thur	Mar 9	--	Exam 1	--	--
Tues	Mar 14	12	Water treatment: hardness, alkalinity	Ch 2, 6	Quiz 6
Thur	Mar 16	13	Water treatment – hardness, softening, membranes	Ch 6	PS5 due
Tues	Mar 21	--	Spring break		--
Thur	Mar 23	--	Spring break		--
Tues	Mar 28	14	Wastewater treatment; activated sludge	Ch 6	Quiz 7
Thur	Mar 30	15	Wastewater treatment;	Ch 6	PS6 due
Tues	Apr 4	16	WWT sludge; adv trtmt; Balt; Chesapeake Bay Nonpoint source control	Ch 6	Quiz 8
Thur	Apr 6	17	Nonpoint source control	Posted readings	PS7 due
Tues	Apr 11	18	Nonpoint source control	posted readings	Quiz 9
Thur	Apr 13	--	Exam 2		
Tues	Apr 18	19	Nonpoint source control	posted readings	Quiz 10
Thur	Apr 20	20	Nonpoint source control Air pollution	Ch 7	PS8 due
Tues	Apr 25	21	Air pollution control	Ch 7	Quiz 11
Thur	Apr 27	22	Air pollution control Solid waste management	Ch 7 Ch 9	PS 9 due
Tues	May 2	23	Solid waste management Prep for field trip	Ch 9	Quiz 12

Thur	May 4	24	Field trip		PS 10 due
Tues	May 9	25	Renewable energy	Posted readings	Quiz 13
Thur	May 11	--	Renewable energy	--	
Tues	May 16	--	Lightning talks	--	City write-ups due
Tues	May 23	--	Final Exam 10:30 -12:30		

UMBC Policies on Equity and Inclusion

Accessibility and Disability Accommodations, Guidance and Resources

Accommodations for students with disabilities are provided for all students with a qualified disability under the Americans with Disabilities Act (ADA & ADAAA) and Section 504 of the Rehabilitation Act who request and are eligible for accommodations. The Office of Student Disability Services (SDS) is the UMBC department designated to coordinate accommodations that creates equal access for students when barriers to participation exist in University courses, programs, or activities. If you have a documented disability and need to request academic accommodations in your courses, please refer to the SDS website at sds.umbc.edu for registration information and office procedures. SDS email: disAbility@umbc.edu
 SDS phone: (410) 455-2459 If you will be using SDS approved accommodations in this class, please contact the instructor to discuss implementation of the accommodations. During remote instruction requirements due to COVID, communication and flexibility will be essential for success.

Sexual Assault, Sexual Harassment, and Gender Based Violence and Discrimination

UMBC Policy and Federal law (Title IX) prohibit discrimination and harassment on the basis of sex, sexual orientation, and gender identity in University programs and activities. Any student who is impacted by sexual harassment, sexual assault, domestic violence, dating violence, stalking, sexual exploitation, gender discrimination, pregnancy discrimination, gender-based harassment or retaliation should contact the University's Title IX Coordinator to make a report and/or access support and resources: Mikhel A. Kushner, Title IX Coordinator (she/they) 410-455-1250 (direct line), kushner@umbc.edu

You can access support and resources even if you do not want to take any further action. You will not be forced to file a formal complaint or police report. Please be aware that the University may take action on its own if essential to protect the safety of the community.

If you are interested in or thinking about making a report, please use the Online Reporting/Referral Form. Please note that, if you report anonymously, the University's ability to respond will be limited.

Notice that Faculty are Responsible Employees with Mandatory Reporting Obligations:

All faculty members are considered Responsible Employees, per UMBC's Policy on Sexual Misconduct, Sexual Harassment, and Gender Discrimination. Faculty are therefore required to report any/ all available information regarding conduct falling under the Policy and violations of the Policy to the Title IX Coordinator, even if a student discloses an experience that occurred before attending UMBC and/or an incident that only involves people not affiliated with UMBC. Reports are required regardless of the amount of detail provided and even in instances where support has already been offered or received.

While faculty members want encourage you to share information related to your life experiences through discussion and written work, students should understand that faculty are required to report past and present sexual assault, domestic and interpersonal violence, stalking, and gender

discrimination that is shared with them to the Title IX Coordinator so that the University can inform students of their rights, resources and support. While you are encouraged to do so, you are not obligated to respond to outreach conducted as a result of a report to the Title IX Coordinator. If you need to speak with someone in confidence, who does not have an obligation to report to the Title IX Coordinator, UMBC has a number of Confidential Resources available to support you:

The Counseling Center (Main Campus): 410-455-2472 / After-Hours 410-455-3230 [Monday – Friday; 8:30 a.m. – 5 p.m.]

Center for Counseling and Consultation (Shady Grove Campus): 301-738-6273 (Messages checked hourly) Online Appointment Request Form

University Health Services: 410-455-2542 [Monday – Friday 8:30 a.m. – 5 p.m.]

Pastoral Counseling via Interfaith Center: 410-455-3657; interfaith@umbc.edu [7 days a week; Fall and Spring 7 a.m. – 11 p.m.; Summer and Winter 8 a.m. – 8 p.m.]

Other Resources:

Women's Center (for students of all genders): 410-455-2714; womenscenter@umbc.edu.

[Monday – Thursday 9:30am-6pm and Friday 9:30am-4pm]

Shady Grove Student Resources, Maryland Resources, National Resources.

Child Abuse and Neglect:

Please note that Maryland law and UMBC policy require that faculty report all disclosures or suspicions of child abuse or neglect to the Department of Social Services and/or the police.