University of Maryland
CENTER FOR ENVIRONMENTAL SCIENCE

Chesapeake Bay Health

3 credits

MEES 498I/698I
FALL 2021

Course Objectives / Overview

This course is designed to provide students with a broad perspective on the subject of environmental health issues pertinent to the Chesapeake Bay. It will be a comprehensive course in which a definitive description of basic concepts and principles, laboratory testing and field situations, as well as examples of typical data and their interpretation and use by industry and water resource managers, will be discussed. Numerous examples and case studies will be presented, many by local leading experts. Concepts and examples will be discussed in a broader perspective with references to other estuarine systems. Classes will consist of lectures by the instructor together with some guest speakers in addition to group discussions.

Expected Learning Outcomes

Following completion of this course students will;

(1) Have grasped basic concepts in environmental science, including ecosystem health, management and regulatory issues by completing homework assignments and exams.
(2) In interactive discussions describe how their actions may influence environmental health.
(3) Identify a current topic of concern in environmental health and summarize current data/papers and present to the class in an oral format including directing an open class discussion. For 600-levels this will culminate in a final paper outlining data gaps and proposing future research in the area of study.

Course Assessment / Grading

There will be assignments, in class activities and a mid-term and final exam (modifications may be made due to COVID etc). Students will identify a topic (~in week 5) for which a critical evaluation will be made, presented in class including discussion questions. There will be additional assignments and a final paper for 600 level students.

Homework assignments:	20%
Class discussions:	10%
Mid–semester / final exam	20% each
One page summary graphic	10%
Final Presentation/Discussion	20%

For 600 level students in addition to the above (max. 80% of total grade) the final 'proposal' will be 20% of the final grade.

INSTRUCTOR DETAILS:

Faculty:
Carys Mitchelmore
(mitchelmore@umces.edu)
410-326-7283

CLASS MEETING DETAILS:

Dates: Mon/Weds
Times: 11-12.30pm
Originating Site: UMCES, CBL
Zoom details:
Meeting ID: to be sent*
Password: to be sent*
Course information: via moodle LMS
Login: your full email address
Initial password: NewPage1
(please change this to a password you prefer when you first log in, thanks)
***; please contact the Instructor for these details before classes start**

COURSE TYPE:

Check all that apply

☐ Foundation
☐ Professional Development
☐ Issue Study Group
☐ Seminar
X Elective

Prerequisites
None

Teaching Assistant
None

Tentative Weekly Course Schedule

Lecture Outline: This is a general outline and specific topic examples may change depending upon the guest lectures. The goal is to discuss the major inputs and stressors into the Bay in Section A and in Section B to discuss specific issues regarding the main organisms in the Bay. Throughout the class specific case examples will be given to outline the topic under discussion. The general class outline is as follows:

Section A Introduction & Background of the Chesapeake Bay Ecosystem

Section B Pollutants and Stressors in the Bay

This will include their sources, fate, effects and examples; including; historic contaminants (metals, including mercury; organic contaminants (PAH/PCB/pesticides), sediment), current emerging contaminants (personal care products (e.g. sunscreens), nanomaterials and pharmaceuticals) and invasive species. The impact of multiple stressors, land use change and climate change will also be discussed.

Section C Major organisms and issue case studies in the Chesapeake Bay

This will include historic and current issues regarding an array of major species in the Chesapeake Bay with discussion as to impacts to the populations and management / restoration efforts. This will include; the Eastern oyster, various fish species (e.g. brown bullhead, striped bass), the blue crab and submerged aquatic vegetation.

Required textbooks, reading and/or software or computer needs

No textbooks are required.

Throughout the course additional reading from supplementary information from textbooks and journal articles will be included. All lectures will be supplemented with detailed handouts in the form of notes and pertinent literature.

Course Communication and Resources

The course will be taught online using Zoom. We will use the MOODLE system and emails for communication and course materials and assignments. Before each class lecture materials will be provided on the Moodle site.

Campus Policies

It is our shared responsibility to know and abide by the University of Maryland's policies that relate to all courses, which include topics like:

- Academic integrity, Student and instructor conduct, Copyright and intellectual property
- Accessibility and accommodations, Attendance and excused absences
- Grades and appeals

The University of Maryland Center for Environmental Science has drafted and approved of various academic and research-related policies by which all students and faculty must abide.

Please visit http://www.umces.edu/consolidated-usm-and-umces-policies-and-procedures for a full list of campus-wide academic policies.

Course-Specific Policies and Expectations (for student and the instructor)

Class Attendance and participation:

Students are expected to come to every class meeting and participate in discussions and answer directed questions when asked. If a student needs to miss a class meeting occasionally the instructor appreciates an email in advance of this occurrence for informational purposes.

Zoom Policies and the Recording of classes:

I have provided a guide that may help you with some common questions and issues with zoom. For each class it is recommended to have your video turned on so we can have an interactive class experience. Please mute yourself

until you would like to ask a question. There is also the chat function if you would like to communicate with that although an audio question is preferred. In each class I will be directing questions to everyone to make sure all are engaged. Each class may be recorded and so in taking this course you acknowledge and agree to being recorded. If you would like a copy of the class please let me know BEFORE the class starts.

Make-Up Assessments and Late Assessments:

With appropriate documentation, all assessments can be made up. If you have missed an in-class assessment such as an exam or in-class group work, please email me within 24 hours of the missed assessment. If you know in advance that you will be missing an in-class assessment, please reach out to me as soon as you are aware to make arrangements.

COVID-19 Amendments:

This course has been run online for a number of years so I do not expect any serious technical issues. However, as you will all be joining remotely via a number of individual connections into class and not necessarily from a University campus I would like you to please bear with me if any technical issues arise and be considerate of your other classmates and patient and understanding as we work though these new issues. If anyone is experiencing any difficulties in any aspect of this course PLEASE reach out to me and I will work with you to help with any problems and work towards a solution for you. I am also aware that things in these challenging times are constantly changing and my goal is for us to work together to ensure that this course provides the best educational experience possible. If at any time you have a problem, please reach out to me, we will solve it !

Course level differentiation specifics:

Lectures will be the same for both the 400 and 600 level course. For the 600 level course students will be given additional reading material/homework assignments, complete additional exam questions, and prepare a 'proposal' for future Chesapeake Bay research needs. In addition to exams both the 400 and 600 levels will complete a final oral presentation on a case study of their choice regarding Chesapeake Bay health issues.

Course Format, Activities, and Learning Assessments

There are five (or six for 600-level students) types of assessments in this class. Please see the table at the end of this section for point allotments.

1. Exams:

Two exams (20% each) will be given over the semester (see course schedule below) and will be based on lecture material and discussions attached to readings. This will be a mid-term and a final exam. The exams will be a combination of multiple choice, short answer, and essay-style (one page) questions. Review sheets and example questions for the exams will be provided by the instructor. Clear communication about material on an upcoming exam will be provided no later than a week in advance of the exam.

2. and 3. Homework Assignments/In class discussions and participation:

A critical part to any field of research is scientific literacy. Throughout the course students will read journal articles or watch a scientific video ahead of class, and during or outside of class students will complete an assignment about the article/video. A discussion to review the answers will take place in class or via moodle at a later date. The assignment will be graded individually. Students are expected to engage in class by asking questions and participating in facilitated discussions, especially those based on extra readings. An ***obvious*** lack of engagement will result in lost points in this assessment category.

4. One page infographic/communication piece:

As part of your research into your topic of interest you will work on summarizing it into a one page communication piece or flyer that would be useful for members of the public or other stakeholders to use to understand the issue/problem. Examples of these will be given in class to help guide you with your design and content.

5. and 6. End-of-Semester Presentation:

The end of semester presentation will be a summary and in class led discussion on a topic of your choice pertinent to environmental health. You need to pick a topic of environmental toxicological concern (let me know the topic so I can check that it is suitable and not duplicative of anyone else's etc., I can also help you with ideas). You should research the topic and summarize it (more specifics on length and time will be sent nearer the time) in an oral discussion and think of questions to ask about it? Like what is missing? What research is needed ? What can we do? For the 600-level students they should also expand on this for an additional assignment which is to write a (short) proposal summary on. The proposal should be roughly 5 pages in length, be in 12-point font with 1" margins, double spaced and utilize at least FIVE peer-reviewed scientific journal articles and include a study design and expected goals/outcome of the study. The goal is to think about what you would propose to enhance the scientific understanding of the topic understudy. Rubrics for the presentations and the paper will be posted on moodle further into the semester. The proposal will be due on the day that the final exam would be scheduled for.

Learning Category Assessments	**Percentage**
Exams (midterm and final) – 20% each	40%
End-of Semester Presentation/Discussion	20%
Homework assignments	20%
In class discussions	10%
One page summary graphic	10%
Total	**100%**

NOTE: for 600-level students the above is 80% of the grade the final 20% is the final proposal. Also please note that these grade assignments may change depending on COVID changes/issues throughout the semester.

Grades

Your grade is determined by your performance on the learning assessments in the course and is assigned individually (not curved). If earning a particular grade is important to you, please speak with me at the beginning of the semester so that I can offer some helpful suggestions for achieving your goal. All assessment scores will be emailed directly to you together with a breakdown of your grade and specific comments. There will also be a posted guide on moodle (if appropriate showing example correct answers).

If you would like to review any of your grades (including the exams), or have questions about how something was scored, please email me to schedule a time for us to discuss this. Late work carries a 10% reduction penalty per day of lateness starting immediately after the class in which it was due. Please see the policies previously mentioned regarding make-up assessments.

I am happy to discuss any of your grades with you, and if I have made a mistake I will immediately correct it. Any formal grade disputes must be submitted in writing and within one week of receiving the grade. Final letter grades are assigned based on the percentage of total assessment points earned and may differ between assignments/exams.

PRIOR YEAR EXAMPLE : MEES 498I/698I Proposed Lecture Schedule Fall 2020

(please note the Fall 2021 detailed schedule is still being finalized)

Week	Date	Time	Topic	Inst'or	Assignment SET	Assignment DUE
1	Aug 31	Mon	(A1) Course overview; Intro. & History of the Chesapeake Bay	CM	HW1 ALL - blog	
	Sept 2	Weds	(A2) Water security, Chesapeake Bay Watershed Health	CM		HW1 ALL - blog
2	Sept 7	Mon	NO CLASS LABOR DAY			
	Sept 9	Weds	(B1) Historic contamination: source/ transport	CM		
3	Sept 14	Mon	(B2) Emerging contaminants; drugs, pesticides, PCPs	CM		
	Sept 16	Weds	(B3) Transport and fate of pollutants	CM	HW2 600 level – Eco	
4	Sept 21	Mon	(B4) Bioavailability and bioaccumulation	CM		
	Sept 23	Weds	(B5) Biotransformation and impacts	CM		HW2 600 level – Eco cf
5	Sept 28	Mon	(B6) Climate change, changing land use and habitat loss	CM	HW3 ALL – video Q	
	Sept 30	Weds	(B7) Biomonitoring, Biomarkers, forensics, toxicity tests	CM		
6	Oct 5	Mon	**In class review and questions**	CM		HW3 ALL – video Q
	Oct 7	**Weds**	**MID TERM EXAM (moodle / in class exam)**	**CM**	**MID TERM**	**MID TERM**
7	Oct 12	Mon	(C1) Case Study 1: Invasive species and control (e.g. ballast water)	CM		
	Oct 14	Weds	(C2) Case Study 2: Chesapeake Bay blue crabs	TM	**ALL: Send in ppt topic**	**ALL: Send in ppt topic**
8	Oct 19	Mon	(C3) Case Study 3: Nutrients/hypoxia in the Bay	JT		
	Oct 21	Weds	(C4) Case Study 4: Methane in the Chesapeake Bay	LL		
9	Oct 26	Mon	(C5) Algal blooms, HABs, SAV	CM		
	Oct 28	Weds	(C6) Case Study 6: Chemical tracers/chlorinated waters	MG/LP		
10	Nov 2	Mon	(C7) Case Study 7: Oysters in the Chesapeake Bay	MW		
	Nov 4	Weds	(C8) Case Study 8: Microplastic pollution/ impacts	LY		
11	Nov 9	Mon	(C9) Case Study 9: Amphibians/reptiles in the Bay	CR		
	Nov 11	Weds	(C10) Toxicity tests (laboratory and field based)	CM	HW4 ALL	
12	Nov 16	Mon	(C11) Case Study 11: Mercury in the Bay	AH		
	Nov 18	Weds	(C12) Case Study 11: Chesapeake dolphins/acoustics	HB		
13	Nov 23	Mon	(C13) Case Study 13: Environmental Risk Assessment/legislation	SL		HW4 ALL
	Nov25	Weds	**THANKGIVING ☺ - no class**			
14	Nov 30	Mon	(C14) Case Study 15: Sea level rise in Chesapeake Bay	HK		
	Dec 2	Weds	Student Presentation Day 1 (see schedule)	CM	**ALL – ppts due**	**ALL – ppts due**
15	Dec 7	Mon	Student Presentation Day 2 (see schedule)	CM		
	Dec 9	Weds	Student Presentation Day 3 (see schedule)	CM		
16	Dec 14	Mon	Reading day – no class			
	Dec 16	**Weds**	**FINAL EXAM (moodle/in class)– PROPOSAL DUE (600 level only)**	**CM**	**FINAL EXAM**	**FINAL EXAM 600 level paper due**

***Case study topics may include:** fracking, viruses and disease, algal blooms and toxins, fish diseases, regulation and management, mountain top mining, blue crab fisheries and diseases, oysters and blue crabs, amphibians and reptiles, endocrine disrupting chemicals, sea level rise issues, mercury issues, emerging chemicals, offshore wind energy development, dolphins in the Bay, submerged aquatic vegetation (SAV).