University of Maryland
CENTER FOR ENVIRONMENTAL SCIENCE

Chesapeake Bay Health

3 credits

MEES 698I/498I
FALL 2018

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. In addition, concepts and examples will be discussed in a broader perspective with references to other estuarine systems (e.g. San Francisco Bay, Puget sound). 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, mid-term and final exams.
(2) 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 discussion with the rest of the class. 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 a mid-term and a final exam. Students will also identify a paper around week 5 describing a specific case example for which a critical evaluation / assessment will be made and presented as a class presentation including discussion questions which the student will lead. Periodic homework assignments for 600 level students will involve analyzing and discussing selected articles.

Mid –semester exam	25% (in class exam)
Final exam	35% (in class exam)
Presentation / Discussion	40%

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: will be emailed to students ahead of class.
Course information: via moodle

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. A detailed table for specific topic details will be given in the first week of class. 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

We will use the MOODLE system and emails. Before each class lecture materials will be provided on the moodle site.

Campus Policies

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

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 and written) presentation on a case study of their choice regarding Chesapeake Bay health issues.

MEES 498I/698I Proposed Lecture Schedule Fall 2020

Week	Date	Time	Topic	Inst'or
1	Aug 31	Mon	(A1) Course overview; Intro. & History of the Chesapeake Bay	CM
	Sept 2	Weds	(A2) Water security, Chesapeake Bay Watershed Health	CM
2	Sept 7	Mon	NO CLASS LABOR DAY	
	Sept 9	Weds	(B1) Historic contamination: source and transport mechanisms	CM
3	Sept 14	Mon	(B2) Emerging contaminants; drugs, pesticides, PCPs etc.	CM
	Sept 16	Weds	(B3) Bioavailability and bioaccumulation	CM
4	Sept 21	Mon	(B4) Biotransformation and impacts	CM
	Sept 23	Weds	(B5) Nutrients: general concepts, algal blooms, HABs	CM
5	Sept 28	Mon	(B6) Climate change, changing land use and habitat loss	CM
	Sept 30	Weds	(B7) Biomonitoring, Biomarkers, forensics, toxicity tests	CM
6	Oct 5	Mon	(B8) TMDLs and Chesapeake Bay management and regulation	CM
	Oct 7	**Weds**	**MID TERM EXAM (in class exam)**	**CM**
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
8	Oct 19	Mon	(C3) Case Study 3: Nutrients/hypoxia in the Bay	JT
	Oct 21	Weds	(C4) Case Study 4: TBD	
9	Oct 26	Mon	(C5) Case Study 5: TBD	
	Oct 28	Weds	(C6) Case Study 6: TBD	
10	Nov 2	Mon	(C7) Case Study 7: Oysters in the Chesapeake Bay	MW
	Nov 4	Weds	(C8) Case Study 8: Plastic/Microplastic pollution and impacts	LY
11	Nov 9	Mon	(C9) Case Study 9: Amphibians and reptiles in the Chesapeake	CR
	Nov 11	Weds	(C10) Case Study 10: Offshore wind energy development in MD	HB
12	Nov 16*	Mon	(C11) Case Study 11: Chesapeake Bay dolphins and acoustics	HB
	Nov 18*	Weds	(C12) Case Study 12: TBD	
13	Nov 23	Mon	(C13) Case Study 13: Environmental Risk Assessment/legislation	SL
	Nov 25	Weds	**THANKGIVING ☺ - no class**	
14	Nov 30	Mon	(C14) Case Study 15: Sea level rise in the Chesapeake Bay	HK
	Dec 2	Weds	(C15) Case Study 15: TBD	
15	Dec 7	Mon	Student Presentation Day 1 (see schedule)	CM
	Dec 9	Weds	Student Presentation Day 2 (see schedule)	CM
16	Dec 14	Mon	Reading day – no class	
	Dec 16	**Weds**	**FINAL EXAM (in class)– PROPOSAL DUE (600 level only)**	**CM**

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).