Estuarine and Coastal Ecology
EVPP/BIOL 581

Instructor: **Dr. Kim de Mutsert,**
Assistant Professor, Environmental Science and Policy

Course Description and Goals: This course is an overview of the ecology of coastal systems including rocky coasts, salt marshes, mangroves, seagrasses, and beaches. There will be an emphasis on estuaries, for example the Chesapeake Bay. During the course, students will examine the physical, chemical, and biological processes and their interrelationships. Students will learn concepts in coastal geomorphology, physical oceanography, biogeochemistry, biology, ecosystem ecology, and anthropogenic impacts as related to estuaries and coasts. After completion of the course, students should have knowledge of the physical, chemical, and biological processes operating in this system. Student should understand how these systems are formed, and why and how they are important. In addition, students should understand that anthropogenic factors affect these systems. Through this course, students will also strengthen their presentation and discussion skills, and their ability to interpret scientific literature and think critically.

Course Content and Instructional Methods: The course consists of lectures and student presentations followed by discussions. Below is a list of lecture topics by week. Lectures will consist of power point presentations that will be posted to our course on the day of the lecture. All students will give a 15-minute (max) presentation in class on a topic of their choosing within the subject of Estuarine and Coastal Ecology (the topic does not have to correspond with the lecture topic of that week). One week before each presentation, the presenting student will assign one paper (publication in a scientific journal) to the rest of the class on the topic of their presentation. Each presentation will be followed by a 15-minute question and discussion session about the presentation and the assigned paper. Reading and interpreting scientific papers is part of the course; your participation grade (25 pts of total) will be based on reading the assigned material and participating in the discussions. Check the course web site every week for readings that are part of the course material. The last day of class all students will turn in a 10-page term paper; the topic of this paper will be the same topic as their presentation. Students should use multiple sources (books or publications in scientific journals) for their term papers.

A separate lab will be offered every other summer that compliments this course (EVPP/BIOL 582). The lab is a facultative part of the course (it is a separate 1-credit course), but highly recommended. During the lab students will receive hands-on experience in the field on the topics discussed in class at different field sites in the Potomac River and the Chesapeake Bay. In three fieldtrips, the estuarine environment from freshwater tidal to the Atlantic coast will be experienced and sampled.

Grading:	2 mid term exams:	125 pts each
	Cumulative Final:	150 pts
	Participation:	25 pts
	Student Presentations:	75 pts
	Term Paper:	100 pts

Honor Code: Adherence to the *GMU Honor Code* is expected of all students, specifically:

> *Members of the George Mason University community pledge not to cheat, plagiarize, steal, or lie in matters related to academic work.*

In all assignments and communications, plagiarism will not be tolerated. This applies equally to oral and written communications in the context of any evaluated (graded) course assignments. Work submitted for credit in a different class cannot be resubmitted for credit in this class. In presenting quotes, paraphrasing statements or logical

arguments from others in any medium (on-line, oral or written), students should properly cite their source. Any public usage of original material from this course (e.g., presentations, images, etc.) without explicit permission of its creator shall be construed as stealing. As stated in the Honor Code, infractions may result in invalidated credit for dishonorable work and lowered grade, including failure from the class, suspension or dismissal. Inquiries for clarification from the professor are welcome. Thank you in advance for your conscious attention to these issues.

Absenteeism Policy: Please inform your instructor in advance if you will be absent from class due to sickness or other reasons.

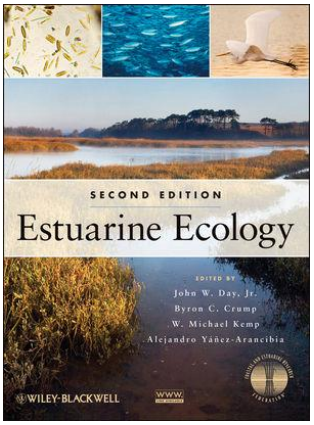
Lecture Topics and Assignments Schedule

Week	Date	Topic	Readings
1	1/25	Intro to Class and Coasts; Coastal and Estuarine Processes	Ch. 1 and Bb
2	2/1	Geomorphology	Ch. 2
3	2/8	Biogeochemistry; Student Presentation	Ch. 3
4	2/15	Microbial Ecology; Student Presentation	Ch. 9 and 10
5	2/22	**Exam 1:** Physical and Biogeochemical Considerations (Everything offered from week 1-4)	
6	2/29	Phytoplankton and Benthic Algae; Student Presentation	Ch. 4 and 8
7	3/7	Spring Recess	
8	3/14	Guest speaker TBA + Movie: "The Living Planet: The Margins of Land"	
9	3/21	Saltmarshes, Mangroves and Seagrasses; Student Presentation	Ch. 5, 6, and 7
10	3/28	Zooplankton, Zoobenthos and Nekton; Student Presentation	Ch. 11, 12, 13
11	4/4	**Exam 2:** Biological Life in Estuaries (Everything offered from week 6-10)	
12	4/11	Ecosystem Ecology and Energy Budgets; Student Presentation	Ch. 15, 17
13	4/18	Foodwebs and Models; Student Presentation	Ch. 16, 21
14	4/25	Estuarine Fisheries; Student Presentation	Ch. 18 and Bb
15	5/2	Global Warming and other Human Impact; **All Term Papers Due**	Ch. 19 and 20

Cumulative Final Exam (Study everything offered in this class): Date: 5/9 **Time:** 4:30-6:30 PM

Readings:

Assigned textbook:



Day, J. W. Jr., B. C. Crump, W. M. Kemp and A. Yáñez-Arancibia (eds). 2012. Estuarine Ecology, second edition. Wiley-Blackwell, New Jersey. ISBN: 978-0-471-75567-8.

This book is accompanied by a companion website:
www.wiley.com/go/day/estuarineecology

Other suggested readings for this class:

Bertness, M. D., S. D. Gaines and M. E. Hay (eds). 2001. Marine Community Ecology. Sinauer Associates, Inc. Sunderland, MA.

Day, J. W. Jr., C A. S. Hall, W. M. Kemp, and A. Yanez-Arancibia (eds). 1989. Estuarine Ecology. John Wiley & Sons, Inc. New York.

Woodroffe, C. D. 2002. Coasts: Form, process and evolution. Cambridge University Press, Cambridge, UK.