EVPP 507 SCIENCE OF THE ENVIRONMENT II

GEORGE MASON UNIVERSITY

3 Credit Hours Fall 2020

4:30-7:10 p.m. Mondays, Innovation Hall 139

Instructor: Dr. Cindy Smith **Email:** csmitc@gmu.edu
Office Hours: DK 3024: 10-11:30am MW, or by appointment online

Course Description

Environmental science is explored in a 2-semester sequence providing the foundation in chemistry (I) and biology (II) required for graduate students with social sciences backgrounds seeking a degree and career in environmental science and policy. This course will examine the multitude of environmental problems (e.g. invasive species, population growth, and climate change) facing society with a strong emphasis on understanding the biology, from molecular building blocks to organismal behavior. The basic principles of biology will be reviewed and applied in a manner that will enable the student to develop a framework for evaluating current and future threats to the environment. After completing this course, students will feel more confident engaging scientists, academics, and policy makers in discussions relating to the biological aspects of environmental problems

Course Objectives

- To prepare students for more advanced environmental science courses.
- Students will review and discuss the basic concepts which are the core foundation of the biological nature of environmental problems.
- Students will summarize how molecules relate to structures to functions, which in turn shape and control the biosphere.
- Students will translate biological concepts to their peers through short, engaging presentations

Course Expectations

As with any graduate offering, ***this will not be an easy course***. The successful student **must read assignments, study supporting materials, and prepare assignments outside of class**. Self-directed study skills are important. Students need to organize material logically and communicate well orally and in writing. **The emphasis will be on understanding the basics.**

Please turn off cell phones or pagers before class begins. **Professional behavior and adherence to the GMU Honor Code are expected. Absenteeism should be limited to illness or emergencies.** Students should notify the instructor before class

whenever possible if they must miss a class. Students will need to work with the instructor to determine whether class activities can be made up later, although this is likely to be difficult due to schedule conflicts. Students should contact classmates to obtain notes and assignments.

Professional Communication: Students are required to use their GMU email accounts for all class related communications. All emails to the instructor will be respectful and contain a professional introduction (i.e. Dear Dr. Smith, Professor Peters, …) and will be signed with your full name. Students are encouraged to have a professional email signature. If emailing regarding content for a missed class, please connect with your classmates.

Disability Services: If you are a student with a disability and you need academic accommodations, please contact the Office of Disability Services (ODS) at (703) 993-2474, https://ds.gmu.edu/

Assignments and Due Dates

Assignments should be prepared neatly (either hand- or type-written or computer-generated). Be sure to proofread your work to double-check facts, grammar, spelling, and consistency, completeness, and correctness. This book may help:

> Ross-Larson, B. 1996. *Edit Yourself: A Manual for Everyone Who Works With Words.* W.W. Norton & Co., New York, NY.

Missed Exams

A quiz will be given at the start of each of five classes (unless a homework assignment is due) and mid-term and final exams will be given as indicated on the schedule. If a student is seriously ill or must miss the test for another reason, notify your professor, share your doctor's note and options for completing the test will be discussed.

Course Textbooks and Materials

Materials will be posted on Blackboard during the course. The textbook we will use for the course is:

Sadava, D. et.al. (2017). Life: The Science of Biology. 11th ed. Sinauer Associates. (MacMillian Learning)

Valuable web resources include:
http://www.sparknotes.com/biology/ https://www.khanacademy.org/
http://www.onelook.com

Course Requirements

Besides learning core concepts in biology, students will prepare weekly short presentations and take a midterm and a final exam. More information will be provided by the instructor.

Grading Criteria

The total grade received for this course will be based on the following assignments and assessments:

Activity	Percent Contribution to Total Grade	
Participation	10 %	80pt
Five Quizzes (20 pt) and		100pt
Eight Short Presentations (30pt)	40 %	240pt
Midterm Exam	25 %	200pt
Final Exam	25 %`	200pt
		820 pts

An A+ will only be given to reward a truly outstanding effort and performance. Participation requires attendance in class and checking Blackboard for updates and notices at least once per week. The final grade will be based on this scale:

A+ = 100(+)–98, A = 97–90, A- = 89–88, B+ = 87–86, B = 85–80, B- = 79–78, C+ = 77–76, C = 75–70, F ≤ 69

Academic Integrity and our Honor Code

Academic Integrity https://oai.gmu.edu/ Honor Code https://oai.gmu.edu/mason-honor-code/

The principle of academic integrity is taken very seriously and violations are treated gravely. What does academic integrity mean in this course? Essentially this: when you are responsible for a task, you will perform that task. When you rely on someone else's work in an aspect of the performance of that task, you will give full credit in the proper, accepted form. Another aspect of academic integrity is the free play of ideas. Vigorous discussion and debate are encouraged in this course, with the firm expectation that all aspects of the class will be conducted with civility and respect for differing ideas, perspectives, and traditions. When in doubt (of any kind) please ask for guidance and clarification. Students in this course should be aware of the following policies for completing work and taking examinations.

The Mason Honor Code Pledge: ***To promote a stronger sense of mutual responsibility, respect, trust, and fairness among all members of the George Mason University Community and with the desire for greater academic and personal achievement, we, the student members of the university community, have set for this Honor Code: Student Members of the George Mason University community pledge not to cheat, plagiarize, steal, or lie in matters related to academic work.***

For assignments: Students are expected to complete the work on their own, usually using the textbook and other materials, although they may discuss issues and seek guidance on questions from other students or the instructor. These assignments are designed to help you learn the material in preparation for tests.

All exams will be completed by individuals in the classroom (those registered for the course).

Unless otherwise noted by the instructor prior to the exam, these assessments will be taken without the use of study aids, memoranda, textbooks, other books, data, or other information available. The purpose of these assessments is to evaluate the student's progress in understanding the material.

It is important to note that materials produced for this course require creativity in organization and presentation, but that the information presented within the paper or other product must be properly acknowledged as to its source.

Diversity Policy: Through its curriculum, programs, policies, procedures, services and resources, Mason strives to maintain a quality environment for work, study and personal growth. An emphasis upon diversity and inclusion throughout the campus community is essential to achieve these goals. Diversity is broadly defined to include such characteristics as, but not limited to, race, ethnicity, gender, religion, age, disability, and sexual orientation. Diversity also entails different viewpoints, philosophies, and perspectives. Attention to these aspects of diversity will help promote a culture of inclusion and belonging, and an environment where diverse opinions, backgrounds and practices have the opportunity to be voiced, heard and respected.

Sign up for Mason Alert (e.g., weather closings, emergencies) at https://ready.gmu.edu/masonalert/ alert.gmu.edu

See Emergency Preparedness Guides: https://ready.gmu.edu/be-prepared/

Other Useful Campus Resources

- WRITING CENTER: B 213 Robinson Hall; 703-993-1200; http://writingcenter.gmu.edu
- UNIVERSITY LIBRARIES: “Ask a Librarian” https://library.gmu.edu/ask
- COUNSELING AND PSYCHOLOGICAL SERVICES (CAPS): 703-993-2380;
- http://caps.gmu.edu
- LEARNING SERVICES: 703-993-2999 https://learningservices.gmu.edu/
- offers many good study skills workshops and academic coaching!
- ACADEMIC COUNSELING PROGRAM: 703-993-2380: http://caps.gmu.edu/learningservices/academiccounseling.php
- Disability Services: https://ds.gmu.edu/
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**** TENTATIVE SCHEDULE FOR FALL 2020****

EVPP 507 SCIENCE OF THE ENVIRONMENT II

Lecture and Reading Assignments

Week	Lecture	Reading or Other Assignments
1 Aug. 24	Introduction to Environmental Biology, Scientific Principles, Review of Chemistry/Biochemistry, and "Life"	Chapter 1
2 Aug. 31	Biology Overview - Substances of Life	Chapters 2–4
3 Sept.7	No Class Labor Day	
4 Sept. 14	(Molecules of Life) Cells and Cell Membranes	Chapters 5–9
5 Sept. 21	Cell Function: • Cell Metabolism • Cellular Respiration • Photosynthesis • Cell Signaling • Cell and Tissue Architecture	Chapters 10–16 *Short presentations*
6 Sept. 28	Genetics, Gene Expression, Evolution, Microbiology	Chapters 17–24
7 Oct. 5	Evolution of Diversity: • Bacteria • Archaea • Viruses • Seedless plants vs Seed Plants • Fungi	Chapters 25-29 *Short presentations*
8 Oct. 13 Fall Break Meet on Tuesday	Plant Structure and Function: • Deciduous trees vs Coniferous Trees • Transport Systems, • Leaf structure and function • Growth • Environmental challenges **Midterm Exam**	Chapters 33-38 *Short presentations* **Work on Midterm Exam**
9 Oct. 19	**Submit Midterm Exam** Flowering Plants: • Reproduction in flowering plants, • Reproduction in grasses, • Reproduction in ferns • Wetland plant categories (delineation) • Plant- Insect co-evolution	Chapters 37-38 *Short presentations*
10 Oct. 26	Animal Origins: Evolution of Body Plans • Protostomes vs Deuterostomes • Body cavities • Digestive tracts • Circulatory systems • Body coverings	Chapters 30-32; Chapters 39 - 43 *Short presentations*

11 Nov. 2	Animals Form and Function • Annelid Diversity • Mollusk Diversity • Arthropod Diversity 1 • Arthropod Diversity 2 • Complete vs Incomplete Metamorphosis • Gas exchange strategies	Chapters 30-32; Chapters 39 - 48 *Short presentations*
12 Nov. 9	Deuterostome Animals: Major groups • Echinoderms – larval vs adults, body plan • Hemichordates – body plant and feeding • Chordates: distinguishing characteristics • Hagfish vs lampreys • Bony fish vs cartilaginous fish • Advantages/disadvantages of egg laying	Chapters 32, 39-51, 49 *Short presentations*
13 Nov. 16	Diseases (Symbioses, Plant Diseases, Animal Immune Systems) Guest lecturer	Chapters 38, 39-41
14 Nov. 23	Human & Animal Physiology • Types of Tissues • Organ Systems • Body Temperature Regulation • Types of Hormones, hormones that control molting • Sexual vs asexual reproduction advantages	Chapter 39, 42 *Short presentations*
15 Nov. 30	**--------No Class Thanksgiving------**	Chapters 43-52
16 Dec. 7	Chesapeake Bay organisms and watershed issues **Final Exam**	Work on Final Exam
TBA	**Submit Final Exam**	