

# Environmental Science: Biological Diversity and Ecosystems

EVPP 301 -001

Synchronous In person Lecture Monday / Wednesday 3:00 – 4:15pm

David King Jr. Hall 2053

## Lecture Instructor

Dr. Amy Fowler

Virtual Office hours: M 415-6pm

Email: afowler6@gmu.edu

## Laboratory Instructor

Daya Hall-Stratton

By email appointment

dhallstr@gmu.edu

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## Topics of this Course

Together with EVPP 210 and 302, this course is part of a three-semester sequence for environmental science majors, which provides the basic underpinning for majors courses. Topics include the human dimensions of the environment, biological diversity, vertebrate organ systems, conservation biology, and general ecology.

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## Textbooks

*Life: The Science of Biology*. 2017. Sadava, Hillis, Heller, and Berenbaum. 11<sup>th</sup> Edition. (also used in EVPP 210 and 302)

*S&S: Elements of Ecology*. T.M. Smith and R.L. Smith. 9<sup>th</sup> ed. (also used in EVPP 302).

Additional required reading: (1) Leopold: <https://www.uky.edu/~rsand1/china2017/library/Leopold1.pdf>, (2) *Silent Spring* by Rachel Carson. (Bookstore will order, but can get cheap used copies online. Also available as an ebook)

Lab Manual: Jones, R.C., et al. 2020. EVPP 301: Environmental Science: Biological Diversity and Ecosystems. Available online through Blackboard.

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## Grading and Assignments

The course consists of a coupled lecture and laboratory; both must be taken concurrently and your grade will depend on your performance in both lecture and lab.

The final grade you earn in the lecture part of the course will be based on your performance in examinations. There will be **three exams (100 points each), and a final exam**. The final exam will include material since the third exam (required) (50 points) and a cumulative section (optional) (50 points). If you elect not to take the cumulative section, your total out of 350 points will be scaled up to 400 points. Total points for the lecture is 400 points.

The final grade you earn in the laboratory portion of the course will be based on your performance on worksheets (10 worksheets, 8 points each = 80 points), a full laboratory report on *Daphnia* toxicity (40 points), and an oral presentation on the effects of nutrients on algal growth (30 points). Total points for the laboratory is 150 points.

Final grades will be assigned for undergraduates based on a standard plus/minus scale:

A	(94 - 100 %)	C+	(77 - 79.99 %)
A-	(90 - 93.99 %)	C	(73 - 76.99 %)
B+	(87 - 89.99 %)	C-	(70 - 72.99 %)
B	(83 - 86.99 %)	D	(60 - 69.99 %)
B-	(80 - 82.99 %)	F	(< 60 %)

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## Practical Matters

It is not possible to master this material without regular class attendance. I will use some different examples than are in the book and incorporate material from other sources. The PowerPoint lectures, posted on Blackboard, are ***not a substitute for lecture attendance***. Students should focus on taking detailed notes of lectures and synthesizing the information with the ideas illustrated in the slides. Occasionally videos will be shown, and students will be responsible for knowing the organisms as well as the concepts they illustrate. Students are responsible for

everything discussed in lecture, announced changes in the syllabus, and any handouts distributed in class. All of that is fair game for exams.

**Communication:** Students must use their gm.u.edu email account to receive important University information, including communications related to this class. I will not respond to messages sent from or send messages to a non-Mason email address.

Cell phones and other communicative devices are not to be used during class. Please keep them stowed away and out of sight. Laptops or tablets may be permitted for the purpose of taking notes only, but you must submit a request in writing to do so. Engaging in activities not related to the course (e.g., gaming, email, chat, etc.) will result in a significant deduction in your participation grade.

Regarding electronic devices (such as laptops, cell phones, etc.), please be respectful of your peers and your instructor and do not engage in activities that are unrelated to class. Such disruptions show a lack of professionalism and may affect your participation grade.

**Academic Integrity:** It is expected that students adhere to the George Mason University Honor Code as it relates to integrity regarding coursework and grades. The Honor Code reads as follows: “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 forth this: Student members of the George Mason University community pledge not to cheat, plagiarize, steal and/or lie in matters related to academic work.” More information about the Honor Code, including definitions of cheating, lying, and plagiarism, can be found at the Office of Academic Integrity website at <http://oai.gmu.edu>. Students should read these statements and understand their implications and how they apply to this course. Any violation of the code of academic integrity will result in a severe penalty assessed on the final grade. This penalty will range from a **minimum** of a full letter grade reduction to an F for the course. All academic integrity violations will be reported to the Chair of the Department of Environmental Science and Policy, the Dean of the College of Science, and the Director of the Academic Integrity Board.

Any assignment turned in for a grade in this course must reflect your work and your work only.

Some kinds of participation in online study sites violate the Mason Honor code. These include accessing exam or quiz questions for this class; accessing exam, quiz, or assignment answers for this class; uploading of any of the instructor’s materials or exams; and uploading any of your own answers or finished work. Always consult your syllabus and your professor before using these sites.

**Current COVID-19 Policies:** All students taking courses with a face-to-face component are required to follow the university’s public health and safety precautions and procedures outlined on the university Safe Return to Campus webpage (<https://www2.gmu.edu/safe-return-campus>). Similarly, all students in face-to-face courses must also complete the Mason COVID Health Check daily, seven days a week. The COVID Health Check system uses a color code system and students will receive either a Green, Yellow, Red, or Blue email response. Only students who receive a “green” notification are permitted to attend courses with a face-to-face component. If you suspect that you are sick or have been directed to self-isolate, please quarantine or get testing. Faculty are allowed to ask you to show them that you have received a Green email and are thereby permitted to be in class.

Students are required to follow Mason's current policy about facemask-wearing. As of August 11, 2021, all community members are required to wear a facemask in all indoor settings, including classrooms. An appropriate facemask must cover your nose and mouth at all times in our classroom. If this policy changes, you will be informed; however, students who prefer to wear masks will always be welcome in the classroom.

**Basic Course Technology Requirement:** Activities and assignments in this course will regularly use the Blackboard learning system, available at <https://mymason.gmu.edu>. Students are required to have regular, reliable access to a computer with an updated operating system (recommended: Windows 10 or Mac OSX 10.13 or higher) and a stable broadband Internet connection (cable modem, DSL, satellite broadband, etc., with a consistent 1.5 Mbps [megabits per second] download speed or higher).

**Student Disabilities:** Disability Services at George Mason University is committed to providing equitable access to learning opportunities for all students by upholding the laws that ensure equal treatment of people with disabilities. If you are seeking accommodations for this class, please first visit <http://ds.gmu.edu/> for detailed information about the Disability Services registration process. Then please discuss your approved accommodations with me.

Disability Services is located in Student Union Building I (SUB I), Suite 2500. Email:ods@gmu.edu | Phone: (703) 993-2474.

**Student and Faculty Names and Pronouns:** Gender identity and pronoun use: If you wish, please share your name and gender pronouns with me and how best to address you in class and via email. I use she/her for myself and you may address me as “Dr. Fowler” in email and verbally.

**Diversity and Inclusion:** In this course, we welcome and value individuals and their differences, including gender expression and identity, race, economic status, sex, sexuality, ethnicity, national origin, first language, religion, age and ability. We encourage all members of the learning environment to engage with the material personally, but to also be open to exploring and learning from experiences different than their own.

Students are responsible for verifying their enrollment in this class. Schedule adjustments must be made by the deadlines posted in the Schedule of Classes.

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January 24, 2022

Week	Lecture topic and Reading Assignment	Laboratory topic and assignment
24 Jan	(1) Humans and Nature-History (2) Population Dynamics  See Lecture notes AND S&S, Ch. 9	Human Population Growth; Population Pyramids  Lab manual, Lab 1
31 Jan	(3) Environmental Ethics  Leopold: <a href="https://www.uky.edu/~rsand1/china2017/library/Leopold1.pdf">https://www.uky.edu/~rsand1/china2017/library/Leopold1.pdf</a> (4) Biological Diversity: Bacteria and Archaea  Sandava et al.: Ch. 25, 26	Human Survivorship Curves Derived from Gravestones  Lab manual, Lab 2
7 Feb	(5) Biological Diversity: Eukaryotes; (6) Biological Diversity: Fungi, Protists, Plants I  Sandava et al.: Ch. 25, 26, 27, 28, 29, 37	Environmental Ethics Discussion  Lab manual, Lab 3 AND “The Land Ethic” by Aldo Leopold  Using Dichotomous Keys to Identify Organisms Lab 3
14 Feb	<b><u>Exam 1 – Monday, Feb 14</u></b>  (7) Biological Diversity: Plants II: Plant Structure and Function  Sandava et al.: Ch. 33-35	Protist and Fungal diversity, form, and function  Lab manual, Lab 4
21 Feb	(8) Biological Diversity: Animal Diversity I (9) Biological Diversity: Animal Diversity II  Sandava et al.: Ch. 30-31	The Eukaryotic Domain: Plant diversity, form, and function  Lab manual, Lab 5
28 Feb	(10) Biological Diversity: Animal Diversity III (11) Vertebrate Organ Systems  Sandava et al.: Ch. 32, 46-51	The Eukaryotic Domain: Animal diversity, form, and function I  Lab manual, Lab 6
7 Mar	(12) Toxicology  <b><u>Exam 2 Wednesday, March 9</u></b>  See Lec. Notes, Silent Spring, AND S&S: Ch 19	The Eukaryotic Domain: Animal diversity, form, and function II  Lab manual, Lab 7
14 Mar	SPRING BREAK	SPRING BREAK

21 Mar	(13) Conservation Biology (14) Population Ecology Sandava et al.: Ch. 54, 58 AND S&S: Ch. 8-9, 26	Overview of Data Analysis and Scientific Report Writing//Overview of Daphnia Toxicity Lab  Lab manual, Lab 8 AND Appendices
28 Mar	(15) Population Regulation (16) Adaptation and Evolution  S&S: Ch. 5, 10, 11 AND Sadava et al: Ch. 54	Impact of Pesticides Discussion  Chapters 1-4 “Silent Spring” by Rachel Carson AND Lab manual, Lab 8
4 Apr	(17) Life Histories (18) Species Interactions  S&S: Ch. 12-18 AND Sadava et al: Ch. 55	Toxicity Test on a Small Aquatic Organism  <b><u>Formal Write-up; 3 Parts</u></b>
11 Apr	<b><u>Exam 3 – Monday, April 11</u></b>  (19) Communities S&S: Ch. 20-21 AND Sadava et al.: Ch. 56, 57	Effect of Nutrients on Primary Production: Completion  Lab manual, Lab 10
18 Apr	(20) Ecosystems; Decomposers and Local Nutrients (21) Biogeochemical Cycling  S&S: Ch. 22 AND Sadava et al.: Ch. 57	PPT Presentations: Effects of Nutrients on Primary Production ( <b><u>Presentation</u></b> )  Lab manual, Lab 12 AND Appendix on Oral Presentation
25 Apr	(22) Climate Basics (23) Terrestrial Ecosystems  S&S: Ch. 2-4, 22	Toxicity Test – <b><u>Final Paper Due</u></b>
2 May	(24) Biomes (25) Biomes  S&S: Ch. 23, 27	No Lab

**FINAL EXAM – MONDAY, MAY 16, 2022**

**1:30 – 4:15 PM**