Environmental Science: Biological Diversity and Ecosystems – EVPP 301

Spring 2024

Lecture: Monday / Wednesday 1:30 – 3:20 PM, Horizon Hall, Room 5018

Lecture Instructor

Dr. Diego Valderrama
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Office hours: By appointment.
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Laboratory Instructor

Daya Hall-stratton
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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 major courses. Topics include the human dimensions of the environment, biological diversity, vertebrate organ systems, conservation biology, and general ecology.

Textbooks

Life: The Science of Biology. 2020. Hillis, Heller, Hacker, Hall, Laskowski, Sadava. 12th Edition. (also used in EVPP 210 and 302)

Elements of Ecology (S&S). 2014. T.M. Smith and R.L. Smith. 9th ed. (also used in EVPP 302).

Additional required reading:
(1) Leopold, Aldo: 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).

Grading and Assignments

The course consists of coupled lecture and laboratory sessions; 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 and attendance quizzes. There will be **four exams (90 points each)** throughout the semester. The Poll Everywhere platform will be used to record attendance through quizzes based on the material covered in each class (40 points overall). Total points for the lecture portion: 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 portion: 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 %)

Practical Matters

It is not possible to master this material without regular class attendance. I will use some different examples than are in the books and incorporate material from other sources. The PowerPoint lectures 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. Students are responsible for all the material discussed in lecture, announced changes in the syllabus, and any handouts distributed in class.

Please adhere to the list below during lecture and lab:

Be prepared for class.
Do not be late to class (classes will start on time).
Cell phones are **not** to be used in any way, under *any* circumstances during lecture/lab, and should be turned OFF and stowed out of sight for the duration of every lecture/lab.

Students must use their MasonLive 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.

In certain cases, students will be allowed to take the exam at a unique time - this will usually be held in my office. The only valid reasons for missing an assignment deadline or an examination are those accepted by the University and include death in the immediate family and major illness of the student. Any student missing a graded assignment (including tests) for health reasons or other extenuating circumstances may be required to submit at doctor's statement or other appropriate documentation to avoid a zero for that assignment.

Notice Regarding the Poll Everywhere System:

Poll Everywhere is a web-based student response system. Student e-mails will be registered by the instructor prior to the first day of classes (students can confirm their registration by logging in at https://www.polleverywhere.com/login with their Mason credentials). Normally at a random moment during each class period, the instructor will display a Poll Everywhere quiz on-screen and students will provide their responses through their phone apps or by logging in at the web address **pollev.com/dvalder** using their laptops or tablets. Results will appear live on the screen for the class to discuss. Students are strongly advised to download the phone apps for quick, regular access to Poll Everywhere.

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.

Student Disabilities:

If you are a student with a disability and you need academic accommodations, please see me and contact Disability Services at 703.993.2474 or ods.gmu.edu. All academic accommodations must be arranged through that office at the beginning of the semester.

CLASS SCHEDULE:

Week	Lecture Topic and Reading Assignment	Laboratory Topic and Assignment
Jan 17 – 19	(1) Humans and Nature-History See lecture notes	Population Pyramids as Indicators of Human Population Growth Lab manual, Lab 1
Jan 22 - 26	(2) Population Dynamics S&S, Ch. 9 AND Hillis et al.: Ch. 53 (3) Environmental Ethics - Also Leopold: https://www.uky.edu/~rsand1/china2017/library/Leopold1.pdf	Human Survivorship Curves Derived from Gravestones Lab manual, Lab 2
Jan 29 – Feb 2	(4) Biological Diversity: Bacteria and Archaea Hillis et al.: Ch. 24 (5) Biological Diversity: Eukaryotes Hillis et al.: Ch. 25	Environmental Ethics Discussion – "The Land Ethic" by Aldo Leopold Using Dichotomous Keys to Identify Organisms Lab manual, Lab 3
Feb 5 – 9	(6) Biological Diversity: Fungi, Protists, Plants I (7) Biological Diversity: Plants II: Plant Structure and Function Hillis et al.: Ch. 26-28, 32-37	Biological Diversity: The Protists Lab manual, Lab 4
Feb 12 – 16	**Exam 1 – Monday, Feb 12** (8) Biological Diversity: Animal Diversity I Hillis et al.: Ch. 29-31	Biological Diversity: The Plants Lab manual, Lab 5
Feb 19 – 23 **NO CLASS ON WEDNESDAY FEB 21**	(9) Biological Diversity: Animal Diversity II Hillis et al.: Ch. 31	Biological Diversity: The Animals I Lab manual, Lab 6
Feb 26 – March 1	(10) Biological Diversity: Animal Diversity III Hillis et al.: Ch. 38-42 (11) Vertebrate Organ Systems Hillis et al.: Ch.43-50	Biological Diversity: The Animals II Effect of Nutrients on Primary Production: Set Up Lab manual, Lab 7
March 4 – 8	**SPRING BREAK – CLASSES DO NOT MEET**	

Week	Lecture Topic and Reading Assignment	Laboratory Topic and Assignment
March 11 - 15	(12) Toxicology **<u>Exam 2 – Wednesday, March 13</u>**	Effect of Nutrients on Primary Production Data Collection
March 18 – 22	(13) Conservation Biology Hillis et al.: Ch. 57 AND S&S: Ch. 26 (14) Population Ecology Hillis et al.: Ch. 53 AND S&S: Ch.8-9	Toxicity Test on a Small Aquatic Organism
March 25 – 29	(15) Population Regulation Hillis et al.: Ch. 53 AND S&S: Ch.8-9 (16) Adaptation and Evolution S&S: Ch. 5 AND Hillis et al: Ch. 55	First Draft of 'Toxicity Test Lab Report' due for Peer Edits & Lab Report Writing Lab manual, Lab 9
April 1 – 5	(17) Life Histories S&S: Ch. 10, 11 AND Hillis et al: Ch. 55 (18) Species Interactions S&S: Ch. 12-15 AND Hillis et al.: Ch. 54	Impact of Pesticides Discussion – "Silent Spring" by Rachel Carson Lab manual, Lab 8
April 8 – 12	(19) Communities S&S: Ch. 16-18 AND Hillis et al.: Ch. 55 (20) Ecosystems; Decomposers and Local Nutrients S&S: Ch. 20-21 AND Hillis et al.: Ch. 56	Week off to prepare paper and oral presentation
April 15 – 19	(21) Biogeochemical Cycling S&S: Ch. 22 AND Hillis et al.: Ch. 56 **<u>Exam 3 – Wednesday, April 17</u>**	Oral Presentations: Effects of Nutrients on Primary Production
April 22 -26	(22) Climate Basics S&S: Ch. 2 (23) Terrestrial Ecosystems S&S: Ch. 4	Toxicity Test – Final Paper Due on Blackboard
April 29	(24) Biomes S&S: Ch. 23 - 27	

FINAL EXAM – WEDNESDAY, MAY 1, 2024!

1:30 – 4:15 PM