

Environmental Science: Biological Diversity and Ecosystems

EVPP 301

Lecture: Monday / Wednesday 1:30 – 2:45pm, Nguyen Engineering Building, Room 1108

Lecture Instructor

Dr. Diego Valderrama

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Office hours: By appointment.

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Laboratory Instructor

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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). T.M. Smith and R.L. Smith. 9th ed. (also used in EVPP 302).

Additional required reading:

(1) Leopold, Aldo: <http://home.btconnect.com/tipiglen/landethic.html>,

(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 **three exams (90 points each), and a final exam**. The final exam will include material since the third exam (required) (45 points) and a cumulative section (optional) (45 points). If you elect not to take the cumulative section, your total out of 315 points will be scaled up to 360 points. 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 a 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.

Safe Return to Campus:

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>).

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
Aug 22 – 26	(1) Humans and Nature-History (2) Population Dynamics See Lecture notes; S&S, Ch. 9 AND Hillis et al.: Ch. 53	Population Pyramids as Indicators of Human Population Growth Lab manual, Lab 1
Aug 29 – Sept 2	(3) Environmental Ethics Leopold: http://home.btconnect.com/tipiglen/landethic.html (4) Biological Diversity: Bacteria and Archaea Hillis et al.: Ch. 24	Human Survivorship Curves Derived from Gravestones Lab manual, Lab 2
Sept 7 – 9 NO CLASSES ON SEPT 5 – LABOR DAY	(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
Sept 12 – 16	(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
Sept 19 – 23	<u>Exam 1 – Monday, Sept 19</u> (8) Biological Diversity: Animal Diversity I Hillis et al.: Ch. 29-31	Biological Diversity: The Plants Lab manual, Lab 5
Sept 26 – 30	(9) Biological Diversity: Animal Diversity II (10) Biological Diversity: Animal Diversity III Hillis et al.: Ch. 31, 38-42	Biological Diversity: The Animals I Lab manual, Lab 6
Oct 3 – 7	(11) Vertebrate Organ Systems (12) Toxicology Hillis et al.: Ch.43-50	Biological Diversity: The Animals II Effect of Nutrients on Primary Production: Set Up Lab manual, Lab 7
Oct 11 – 14 MONDAY CLASSES MEET ON TUESDAY	<u>Exam 2 Tuesday, Oct 11</u> (13) Conservation Biology Hillis et al.: Ch. 57 AND S&S: Ch. 26	Impact of Pesticides Discussion – “Silent Spring” by Rachel Carson Lab manual, Lab 8

Week	Lecture Topic and Reading Assignment	Laboratory Topic and Assignment
Oct 17 – 21	(14) Population Ecology (15) Population Regulation Hillis et al.: Ch. 53 AND S&S: Ch.8-9	Toxicity Test on a Small Aquatic Organism Lab manual, Lab 9
Oct 24 – 28	(16) Adaptation and Evolution (17) Life Histories S&S: Ch. 5, 10, 11 AND Hillis et al: Ch. 55	Effect of Nutrients on Primary Production: Completion Lab manual, Lab 10
Oct 31 - Nov 4	(18) Species Interactions (19) Communities S&S: Ch. 12-18 AND Hillis et al.: Ch. 54-55	Data Analysis/Scientific Report Writing Lab manual, Lab 11
Nov 7 – 11	(20) Ecosystems; Decomposers and Local Nutrients (21) Biogeochemical Cycling S&S: Ch. 20-22 AND Hillis et al.: Ch. 56	Week off to prepare paper and oral presentation
Nov 14 – 18	<u>Exam 3 – Monday, Nov 14</u> (22) Climate Basics S&S: Ch. 2	Oral Presentations: Effects of Nutrients on Primary Production Lab manual, Lab 13
Nov 21 NO CLASSES ON NOV 23 – THANKSGIVING RECESS	(23) Terrestrial Ecosystems S&S: Ch. 4	No Lab
Nov 28 – Dec 2	(24) Biomes S&S: Ch. 23 -27	Lab Reports on Nutrient Experiment are Due

FINAL EXAM – WEDNESDAY, DECEMBER 7, 2022

1:30 – 4:15 PM