Environmental Science and Policy

4400 University Drive, MS 5F2, Fairfax, Virginia 22030
Phone: 703-993-3187; Fax: 703-993-1066
Website: http://esp.gmu.edu

Fundamentals of Ecology

EVPP 607-001
Fall 2020
[Draft: Subject to revision]

Instructor: Dr. V. Alaric (Al) Sample vsample@gmu.edu

Course meets: Mondays, 7:20-10:00 pm, Innovation Hall 338
Office hours: Mondays 6:00-7:00 PM, DK 3026 or 3035; by appointment

Course overview:

Sound environmental management must be based on sound science. Most environmental managers are not scientists per se, in that they are not themselves engaged in basic research. Yet environmental managers must be able to comprehend and apply the best available science in their daily management activities, and when called upon, inform and guide policymakers so that their decisions will result in policies that are environmentally sound, practical, and effective.

To accomplish this, it is essential that environmental managers themselves have a thorough understanding of the fundamentals of ecological science. The purpose of this course is to provide a basic literacy in the fundamental principles and processes of ecology: the interaction of plant and animal species with their environments; relationships with the atmosphere, soils, water, sources of energy, and other aspects of the physical environment; relationships within their own population and with other life forms in their communities and ecosystems; strategies that species have developed to adapt to their particular environment, and which influence their ability to adapt to changes in their environment, including climate change. The course will also address the application of ecological knowledge to environmental management, and to addressing contemporary issues of environmental management.

Course objectives:

- Develop an understanding of the fundamental concepts of modern ecology
- Become familiar with the variety of ways in which organism interact with both physical and biological aspects of their environment
- Learn to think critically about ecological issues
- Practice writing and presenting scientific material

Texts:

Smith, T.M. and Smith, R.L. 2015. *Elements of Ecology*, Ninth Edition. Pearson. ISBN 978-0-321-93418-5

Assignments: Case study (oral presentation, written paper)

During the semester each student will prepare and present a case study, which will represent 40 percent of your grade and a particularly important part of your learning from this course. Grading will be based on substantive content, the degree of critical thinking the student exercises in examining his or her chosen subject, and the clarity and effectiveness of the written and oral communication.

Purpose and Subject: The purpose of case study is to provide each student an opportunity to apply the principles and insights from the lectures and class discussions to a specific ecological issue of interest to the student. The subject of your case study should be a current or historical ecological issue relevant to your academic and/or career interests. A brief statement of your proposed case study subject should be submitted via email by the second meeting of the class and must be approved prior to the third meeting. I will be available by appointment for consultation and discussion of your proposed case study. A brief abstract (~250 words) of your case study with a preliminary list of references is due by the fourth class.

Oral Presentation: Each student will give an oral presentation based on his or her case study. The oral presentation should be roughly 30 minutes, and will be followed by a facilitated class discussion. Please notify me in advance if the presentation will include the use of PowerPoint slides or other illustrations requiring a projector or other equipment. The presentation should be accompanied by a written outline, with bibliography, to be handed out to the class. The presentation should be of the type and quality for submission at a professional, scientific, or academic conference or symposium.

Written Paper: Each student will also prepare a written paper on his or her case study. Minimum length is 3,000 words, maximum 5,000, not including references. The paper should include an abstract of no more than 250 words, and 3-6 keywords to facilitate document searches. Pages should be double-spaced, and should be numbered. Please add your name to each page in a header or footer. The list of references should start on a separate page. Doctoral students should include at least 20 references, and other students at least 10 references. Citations should follow the standard scientific style (Author-Year). See the Scientific Style and Format Quick Guide[1] for information on how to reference books, articles, websites and other information sources. If needed, use the convenient CSE citation generator[2]. No more than 30 percent of your references should be websites.

Exams (mid-term, final)

There will be an in-class closed-book mid-term examination on the materials covered up to that point in the course, and a comprehensive final examination. Instructions will be included on how to electronically submit the completed exams.

Basis of grading:

Participation in class discussions	10 %
Mid-term exam	20
Case study presentation	20
Case study paper	20
Final exam	30

[1] https://www.scientificstyleandformat.org/Tools/SSF-Citation-Quick-Guide.html

[2] https://kingcitation.com/cse/

98 and up: A+	87-89: B+	77-79: C+	
94-97: A	84-86: B	74-76: C	
90-93: A-	80-83: B-	70-73: C-	< 70: F

Tentative course schedule:

August	24	1. Self-introductions, learning objectives, and course overview and discussion Readings: • Smith and Smith, chapters 1, 2
	31	2. Lecture and class discussion. The physical environment. Readings: • Smith and Smith, chapters 2, 3, 4 *Proposed case study subject to be submitted for approval*
September	7	*Labor Day holiday. No class.*
	14	3. Lecture and class discussion. Adaptation to the environment. Readings: • Smith and Smith, chapters 5, 6, 7 *Deadline for obtaining approval of proposed case study topic*
	21	4. Lecture and class discussion. Population ecology. Readings: • Smith and Smith, chapters 8, 9, 10, 11 *Deadline for case study abstracts*
	28	5. Lecture and class discussion. Species interactions. Readings: • Smith and Smith, chapters 12, 13, 14, 15
October	5	6a. Lecture and class discussion. Community ecology. Readings: • Smith and Smith, chapters 16, 17
	12	*Columbus Day holiday. Monday classes moved to Tuesday this week.*
	19	6b. Lecture and class discussion. Community ecology. Readings: • Smith and Smith, chapters 18, 19 *Mid-term exam; must be completed and submitted by Friday, October 16*
	26	7. Lecture and class discussion: Ecosystem ecology. Readings: • Smith and Smith, chapters 20, 21, 22

November	2	8. Lecture and class discussion: Biogeography Readings: • Smith and Smith, chapters 23, 24, 25
	9	9. Lecture and class discussion: Biodiversity and climate change. Readings: • Smith and Smith, chapters 26, 27
	16	Case study presentations:
	23	Case study presentations:
	30	Case study presentations:
December	7	Reading week: Deadline for submission of case study papers
	14	*Final exam; must be submitted by Wednesday, December 16*

General policies:

Attendance: You are expected to attend every class session and to be there on time. If you have a legitimate excuse for missing a class or being late please let me know, in advance if possible. Unexcused absences or lateness will result in a lowered grade.

Submit dates: The date and time for submitting topics, preliminary statements of papers, case study papers, tests, etc., will be clearly stated. Unless you have cleared with the instructor in advance with a really good reason for delay, late submissions will not be accepted.

University policies:

Academic Integrity: GMU is an Honor Code university; please see the University Catalog for a full description of the code and the honor committee process. 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 please ask for guidance and clarification.

Disabilities: If you are a student with a disability and you need academic accommodations, please contact the Disability Resource Center (DRC) at 703 993 2474. All academic accommodations must be arranged through that office (http://ods.gmu.edu.)

The University Catalog, http://catalog.gmu.edu, is the central resource for university policies affecting student, faculty, and staff conduct in university academic affairs. Other policies are available at http://universitypolicy.gmu.edu/. All members of the university community are responsible for knowing and following established policies.

About the instructor:

Al Sample is senior fellow and president emeritus at the Pinchot Institute for Conservation in Washington, DC, where he served as president 1995-2015; an affiliate professor in Environmental Science and Policy at George Mason University in Fairfax, Virginia; and a Fellow of the Society of American Foresters. He is the author of numerous books, research papers, and articles on topics in national and international environmental and natural resource policy. His research focus is the integration of climate change mitigation, adaptation, and resilience into the evolving institutional, legal, and policy framework for natural resource management. His most recent book is *Forest Conservation in the Anthropocene: Science, Policy, and Practice,* with R. Patrick Bixler and Char Miller (University Press of Colorado, 2016). Sample earned his doctorate in natural resource policy and economics from Yale University, for which he received the National Wildlife Federation Environmental Conservation Fellowship for excellence in graduate research. He holds an MBA and a Master of Forestry both from Yale, and a Bachelor of Science in forest resource management from the University of Montana.