

## ECOLOGY AND EVOLUTION (BIOL 3250 A,B,C) -- Spring Semester 2020

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 Biol. Dept. 333-5759

Office Hours: M 2-4, other times by appointment.

Texts: Smith, R.L., and T.M. Smith. 2001. Ecology and field biology. 6<sup>th</sup> ed.  
 Benjamin Cummings, San Francisco, CA. 771 pp.  
 Hall, B.K., and B. Hallgrimsson. 2008. Strickberger's Evolution. 4<sup>th</sup> ed.  
 Jones and Bartlett, Boston, MA. 762 pp.

**\*\*STUDENTS ARE RESPONSIBLE ON EXAMS FOR ALL INFORMATION FROM LECTURE NOTES,  
 HANDOUTS AND ASSIGNED READINGS.**

Lecture: four 100-pt. lecture exams.

\*Tentative Exam Dates: Feb 14, March 13, April 17, May 8 (Fri, 10:15 am)

Lab = ca. 35% of course grade, from writeups of field/laboratory exercises;  
 including original investigations and computer simulations.

### LECTURE SCHEDULE

Week #	Topic	Chapters in: <i>Evolution (V)</i> , otherwise Ecology
1	Introduction to Ecology	1
1	History and Fundamentals of Evolutionary Theory	<b>V1-3</b>
2	The Nature of Variation	<b>Skim V9-10</b>
2-3	Species and Phylogenies	<b>V11, Skim V12</b>
3	"Evo-Devo"	<b>V13</b>
4-5	Population Genetics and the Mechanisms of Microevolution Patterns of Macroevolution	<b>V21-23</b> <b>V24</b>
6-7	Physical and Physiological Ecology Conditions and Resources	5,6,8 Skim 4,7,9 2,27
	Nutrient/Mineral Cycles Niche Concepts	Skim 25,26 pp. 253-62;383-84
8-9	Population Ecology: Demography, Dynamics, & Density-dependence	10,11, skim 12
10-11	Reproductive Ecology & Life Histories	13
11-12	Interspecific Competition	14
13	Foraging Ecology, Predator-Prey	15,16
14	Community Structure & Dynamics, Stability, Diversity, & Complexity	20
15	Ecosystem Development, Island/Landscape Ecology, Conservation Biology and Preservation of Biodiversity	21,22,23

<b>Tentative Laboratory/Field Schedule</b>	<b>Assignment (pts.)</b>
Week 1 -- Intro to Inland Coastal Plain Ecosystems. (***READ Ecol. pp. 12-17; Skim Ch. 28-31 + Appendix A for ideas***)	Hypotheses (10)
2 -- Phylogenetic Rules and Reconstruction (also, set up Bacterial Selection experiment)	Assignment (10)
3 -- Population Genetics Computer Simulations	Scientific Paper (15)
4 -- TBA	
5 -- Bacterial Selection analysis	Scientific Paper (25)
6 -- Ecological Transect sampling I	TBA
7 -- Human Demography	Life Table (20)
8 -- TBA	
9 -- Mark-Recapture and Pop. Estimation Simulation	Report (20)
10 -- Community Ecology Field Experiment I	
11 -- Analysis of field experimental data	Scientific Paper (35)
12 -- Community Ecology Field Experiment II	
13 -- Community Ecology Field Experiment III	
14 -- Community Ecology Data Analysis	Scientific Paper (45)

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***NOTE: Thursday, March 12 is the last day to withdraw from this or any course***

Some Interesting and Possibly Helpful Websites:

On Evolution-- <http://thisviewoflife.org/>

Online Biology Text --

<http://www.estrellamountain.edu/faculty/farabee/biobk/BioBookEVOLI.html>

Companion site for your Evolution Text:

<http://biology.jbpub.com/evolution/>

Companion site for your Ecology Text:

[http://occawlonline.pearsoned.com/bookbind/pubbooks/smith\\_efb/](http://occawlonline.pearsoned.com/bookbind/pubbooks/smith_efb/)

## Ecology (BIOL 3250) – Spring 2020 Expectations of Students

1. The text chapters will serve as your introduction and background to the lecture topics. Therefore, read them carefully, preferably before the lecture; otherwise, you may find that you are lost! Success in this course demands that you attend every day and come to class prepared.
2. On weeks that I inform you we will be in the field, be prepared to leave for the field promptly at lab time--this includes APPROPRIATE ATTIRE. It may be hot or cold. We will be encountering briars, chiggers, fire ants, ticks, mosquitoes, and possibly snakes; you are responsible for your own protection against these as well as the climatic elements (I can't control either). You may not make up missed labs; I will deduct points from your grade for any lab absences beyond one.
3. An important part of this course is the writing of laboratory reports and scientific papers. We will be collecting data in the field and lab, and analyzing these data, as a group. You will be receiving written and verbal instructions for preparing a scientific paper early in the semester. I expect you to share the basic data and results of certain analyses. I expect each and every person to do his or her own writing, however. Copying of phrases or sentences from references or even slightly modified phrases and sentences "borrowed" from these sources constitutes plagiarism and will not be tolerated in this course. Putting quotation marks around such phrases, even with proper attribution (citation) is not much better; the idea is to use your own unique set of words.

Borrowing of sentences or paragraphs from *your* previously written papers or others' papers is also plagiarism. I keep a file of the best papers from previous classes. I will also use electronic means of detecting plagiarism. Any attempt at plagiarism on any paper will earn the student a grade of zero and will be reported to the Dean of Students office. Repeat violations may warrant additional penalties or disciplinary action, as described on the VSU Biology Department Home Page<sup>1</sup>.

Despite the above admonition, a few students nearly every semester are foolish enough to "test" the system by passing off papers that contained portions plagiarized from earlier papers or from their cited sources or uncited sources. REMEMBER: (1) I KEEP COPIES OF EARLIER STUDENT PAPERS AND OF IMPORTANT PRIMARY REFERENCES; (2) I CONDUCT WEB SEARCHES OF ANY AND ALL SUSPECT PASSAGES.

4. Disruptive Behavior: a) absolutely no cell phone use in lecture or lab/field; b) do not come to class late or leave early (being late to lab may be counted as absence!); c) no talking or voluntary outbursts in lecture... Note: a sneeze is involuntary; the reflexive "bless-you" is voluntary and therefore controllable; just repress that urge, please!
5. Academic Dishonesty: cheating of any kind on an assignment or exam will not be tolerated and will result in failure on assignment, and possibly in the course, plus other penalties as may be allowed by VSU policy (consult the VSU Student Handbook<sup>2</sup>).
6. Each student is responsible for making up any material missed due to absence, regardless of reason. Attitude, attendance, cooperation, etc. are appropriate criteria for me to consider when assigning a final grade when the student's grade is "borderline." Excessive absences, conveyance of negative attitudes, lack of attentiveness or cooperation will not incline me toward giving you that extra "benefit of the doubt" in such decisions.

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<sup>1</sup><http://www.valdosta.edu/biology/>

<sup>2</sup><http://www.valdosta.edu/academics/academic-affairs/vp-office/academic-dishonesty.php>

## BIOL 3250 Expectations (cont'd.)

Ecological fieldwork can be fun and rewarding, but at times it can be hard work under rigorous conditions. If you are not used to either of the latter two, be prepared for a learning experience that may enrich your life in ways you'll only begin to appreciate now. And since we'll all be doing this together, adopting a positive attitude from the start will improve the already likely prospects of this being a positive experience for everyone.

7. If you should have any kind of question, problem, comment, complaint, crisis, etc., involving this course, I'm the appropriate person for you to talk to. Please come by and see me about it immediately; that's what I'm here for. Feel free to stop by anytime (but try office hours first).

8. **STUDENTS WITH DISABILITIES:** Students requiring classroom or testing accommodations because of documented disabilities should discuss their needs with the instructor at the beginning of the quarter. To register with the Access Office, go to Farber Hall or call 245-2498 (voice) or 219-1348 (tty).

### **COURSE GOALS AND LEARNING OUTCOMES:**

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This course is designed to give the Biology Major a basic understanding of the modern theories and principles of biological evolution, the unifying principle of biology explaining the history of life on Earth and the mechanisms by which descendants become modified from their ancestors; and of the several subfields of ecology, which is the study of the individual organism in the context of its physical and biotic environment, as well as the study of populations, communities and ecosystems in their respective environments and interactions among these. We will also explore human influences on these ecological systems and processes. The laboratory experience in the ecology portion of the course will be largely field-based and will give the student a familiarity with several of the predominant ecosystems of the coastal plain of the southeastern United States. During field (and laboratory) exercises, students will put to practice scientific methodology in posing hypotheses, designing experiments and collecting and analyzing data, and finally conveying the results of those investigations in scientifically written reports.

With reference to the Selected Educational Outcomes for the B.S. Degree in Biology (see 2019-2020 VSU Undergraduate Catalog online) and as explained above, BIOL 3250 is particularly designed to give the student extensive background in Outcomes #1 and #5.

With reference to the VSU General Education Outcomes, BIOL 3250 will significantly address the following: #3) Students will use computer and information technology when appropriate; #4) Students will express themselves clearly, logically, and precisely in writing and in speaking, and they will demonstrate competence in reading and listening; #5) Students will demonstrate knowledge of scientific and mathematical principles and proficiency in laboratory practices; #7) Students will demonstrate the ability to analyze, to evaluate, and to make inferences from oral, written, and visual materials.

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