

# ECOLOGY AND EVOLUTION (BIOL 3250 A,B,E) -- Fall Semester 2020

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Biol. Dept. 333-5759

Office Hours: M 2-4, other times by appointment (call or use MS Teams).

e-Texts: Smith, T.M., and R.L. Smith. 2015. Elements of ecology. 9<sup>th</sup> ed. Pearson Education, Inc. Hoboken, NJ.

Bergstrom, C.T., and L.A. Dugatkin. 2016. Evolution. 2<sup>nd</sup> ed. W.W. Norton and Co., NY

!!Students are responsible on exams for all information from lecture, handout, and readings presented in lecture or on BlazeView and e-mail (use ...@valdosta.edu account only)!!

Lecture: four 100-pt. lecture exams (some points may come from online eBook activity\*\*).

\*Tentative Exam Dates: Sep 18, Oct 16, Nov 13, Dec 10 (Thurs, 10:15 am, *ONLINE*)

Lab = ca. 33% of course grade from lab: writeups of field/laboratory exercises; including original investigations and computer simulations.

## LECTURE SCHEDULE

Week #	Topic	Chapters in: <b>Evolution (V)</b> , otherwise <b>Ecology</b>
1	Introduction to Ecology	<b>1</b>
1	History and Fundamentals of Evolutionary Theory	<b>V1, 2</b>
2	The Nature of Variation	<b>Skim V6, 9, 10</b>
2-3	Species and Phylogenies	<b>V4, 5, 14</b>
3	"Evo-Devo"	<b>V13</b>
4-5	Population Genetics and the Mechanisms of Microevolution	<b>V7, 8, 3</b>
6-7	Physical and Physiological Ecology Conditions and Resources	<b>6, 7</b> <b>2, Skim 3, 4</b>
	Nutrient/Mineral Cycles Niche Concepts	<b>Skim 21, 22</b> <b>Section 12.6</b>
8-9	Population Ecology: Demography, Dynamics, & Density-dependence	<b>8, 9, 11</b>
10-11	Reproductive Ecology & Life Histories	<b>10</b>
11-12	Interspecific Competition	<b>12, 13</b>
13	Foraging Ecology, Predator-Prey	<b>14</b>
14	Community Structure & Dynamics, Trophic Cascades, Ecosystem Development, Island/Landscape Ecology,	<b>16-19</b>

<b>Tentative Computer Laboratory/Field Schedule</b>	<b>Assignment (pts.)</b>
Week 1 -- Intro to Inland Coastal Plain Ecosystems. (**READ Ecol. Chapt 1; Skim Chpts. 20-25 for ideas**)	Hypotheses (10)
2 -- Phylogenetic Rules and Reconstruction	Assignment (10)
3 -- Population Genetics Computer Simulations Scientific Writing	Scientific Paper (15)
4 -- Transect sampling (field)	(5)
5 -- Computer Simulation (Darwinian Snails)	Worksheet (10)
6 -- Plot sampling I (field)	(5)
7 -- Computer Simulation (Population Growth)	Worksheet (10)
8 -- Human Demography	Life Table (20)
9 -- Analysis of field sampling data	Scientific Paper (25)
10 -- Computer Simulation (Keystone Predator)	Worksheet (10)
11 -- Plot sampling II (field)	
12 -- Mark-Recapture and Pop. Estimation Simulation	Report (20)
13 -- Data analysis of field sampling	
14 -- Finalize analysis and discuss field results	Scientific Paper (40)

**NOTE 1:** *I reserve the right to alter schedule and/or substitute assignments due to weather, COVID realities, or other factors.*

**NOTE 2:** *Thursday, October 15 is the last day to withdraw from this or any course*

2 Required and 2 Possibly Helpful Websites:

Companion site for your Evolution Text:

<https://digital.wwnorton.com/evolution2> (Register and select Student Set 279892)  
(\*\*I will substitute your average InQuizitive grades on *all* assigned chapters for lowest exam grade)

Companion site for your Ecology Text:

<https://masteringbiology.com> (Register/Log in)

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

Online Biology Text --

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

## **Ecology (BIOL 3250) – Fall 2020 Expectations of Students**

1. Students will wear a fitted facial covering of nose and mouth at all times indoors and when unable to distance outdoors (NOTE: neck gators are not effective and therefore will not meet this requirement; masks with exhaust valves also are not effective, as they vent particles into the air). This is CDC guidance and also a requirement of the University System and VSU; beyond that, it is the right thing for all of us to do to be mutually respectful of each other's health and well-being. If you should develop symptoms or come in close contact with someone who has tested positive or has COVID symptoms, contact the Student Health Center (333-5886) and/or make an appointment with the Lowndes County Public Health Service COVID testing center by calling 844-955-1499, and do not come to class until you receive a negative test and your symptoms clear (or 10 days after symptoms start if you do not get a test). This is a face-to-face course, and although certain resources will be posted online, you are expected to be in class, and any special accommodations will require documentation (including from Student Affairs). VSU's Coronavirus FAQ page is <https://www.valdosta.edu/health-advisory/faq.php>. For whatever reason you might miss class, you must inform the instructor ASAP you will be (or have been) absent and receive instructions for making up work.

2. We will use Microsoft Teams and BlazeView for real-time or recorded access to lectures or labs, (real-time remote access is reserved for students with a documented need; otherwise, I expect you to be there in person). You are assigned to a Team for your lab section and a Team for lecture (called "EvoEco lecture Bergstrom FA2020"). If you want to Teams-call me during office hours, do so during the first hour (2-3 M) and use the lecture Team, and that way anyone in the class can join. If you need to talk privately, call my office phone during the second hour (3-4 M), or call or e-mail some other time from your "...valdosta.edu" account. I may do some review sessions with the whole class, and that will be through the lecture Team.

3. The textbook 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. Exams will come from material covered in lecture, and you must study and know your notes completely, but for understanding you must also read the text.

4. 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 may 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 (unless I receive a notice of approved Special Accommodation from Student Services).

6. 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.

6. Disruptive Behavior: a) absolutely no cell phone use in lecture or lab/field (except that which is part of the lab—e.g., using the iNaturalist app); 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!

7. 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>).

8. 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 unexcused 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 call by phone or MS Teams (latter during office hours), e-mail, or come by and see me alone (latter with mask and social distancing during office hours), as soon as possible; that's what I'm here for.

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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