

## BIOL 3250 – Ecology and Evolution

Spring Semester 2011

*Instructor:* Dr. Carter

*Office:* BC 1105

*Telephone:* (229) 333-5759, ext. 5763

*e-mail:* Please use the mail tool in BlazeVIEW.

*Office Hours:* BC 1040 or BC 1105

Tues & Thurs, 11:00 AM – 12:00 Noon; Wed, 1:00 – 2:00 PM; other times by appointment

### *Weekly Course Schedule*

Tues	Lec Sect DE	9:30 – 10:45 AM, BC 1024
Tues	Lab Sect D	2:30 – 5:20 PM, BC 1046
Wed	Lab Sect E	9:00 – 11:50 AM, BC 1046
Thurs	Lec Sect DE	9:30 – 10:45 AM, BC 1024

### *Miscellaneous*

One three-day weekend field trip to Sapelo Island will be included.

**Course Description.** Prerequisite: BIOL 1100, BIOL 1107, BIOL 1108, and BIOL 3200, each with a grade of “C” or higher, or permission of instructor. An introduction to major topics in ecology and evolution, including population, community, and ecosystem ecology; Darwinian theory of evolution through natural selection; microevolution and macroevolution. Computer and field labs will provide exposure to both evolutionary theory and field ecology. [3-3-4]

Lecture contact: 75 mins X 30 lectures = 2250 mins    Laboratory contact: 170 mins X 15 labs = 2550 mins  
Credit: 4 semester hrs

**Course Outcomes.** This course is designed to meet the following outcomes.

#### *Biology Department Educational Outcomes*

1. Develop and test hypotheses, collect and analyze data, and present the results and conclusions in both written and oral formats used in peer-reviewed journals and at scientific meetings.
5. Interpret ecological data pertaining to the behavior of the individual organism in its natural environment; to the structure and function of populations, communities, and ecosystems; and to human impacts on these systems and the environment.

#### *VSU General Educational Outcomes*

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.

#### **Assessment of Learning**

- Three lecture examinations will be given.
- Written reports and assessments based upon results of field and laboratory exercises

#### **Grading**

##### *Grading Scale*

A = 90 – 100%  
B = 80 – 89%  
C = 70 – 79%  
D = 60 – 69%  
F = <60%

##### *Allocation of points*

Lecture exams (3)	70%
<u>Lab reports and assessments</u>	<u>30%</u>
Total	100%

## Required Text and Related Resources

- Required text  
Smith, R.L., and T.M. Smith. 2001. *Ecology and field biology*. 6th Ed. Benjamin Cummings, San Francisco, CA. 771 pp.  
Companion site for text – [http://occawlonline.pearsoned.com/bookbind/pubbooks/smith\\_efb/](http://occawlonline.pearsoned.com/bookbind/pubbooks/smith_efb/)
- The following web sites will be used for the unit on evolution:  
<http://evolution.berkeley.edu/evosite/evo101/index.shtml>  
<http://www.ucmp.berkeley.edu/clad/clad1.html>

## Miscellaneous Required Items

- Pencils or pens for recording notes, etc.
- Notebook

**Attendance and Punctuality.** Regular attendance and punctuality are expected. The student is responsible for all material missed, regardless of the reason for absence. Students arriving late for class should enter the lecture room or laboratory quietly and take the nearest seat to avoid disruption. Bear in mind that field trips require prompt departure from campus and that tardiness could easily result in a student missing transportation to the field site and absence from the field trip, and that such absences will adversely affect the course grade. Attendance will normally be taken at the beginning of the period. Students who arrive after the roll is taken are counted absent unless they inform their instructor immediately after class or lab of their tardiness. It is the student's responsibility to inform the instructor of her/his tardiness. Each three cases of tardiness will be counted as one absence, and cases of tardiness will be counted as absences thusly, unless a satisfactory explanation is provided to the instructor by the student. It is the instructor's prerogative to have the explanation in writing. Any scheduling problems or other extenuating circumstances necessitating chronic tardiness should be explained to the instructor in writing and properly documented at the beginning of the semester. In order to have an absence excused, the student must provide a written explanation with proper documentation immediately upon returning to class. Providing an explanation of absence or tardiness by the student does not insure that the absence or tardiness will be excused. The instructor shall determine the validity of all excuses. Students absent from more than 20% of the regularly scheduled lecture and laboratory periods are subject to failure in the course, as detailed under Absence Regulations in the VSU Undergraduate Catalog. *Points will be deducted from the final grade for excessive unexcused tardiness or absence.*

**Requirements and Recommendations for Field Trips.** Conditions in the field may be hazardous, they are highly variable, and they are beyond the control of your instructor. Therefore, it is imperative that individual students accept responsibility for taking precautions to protect themselves in the field. Field hazards include ticks, stinging and biting insects, poison ivy, poison oak, poison sumac, briars, and occasionally venomous snakes. Long pants and sturdy shoes or boots are essential for field work. Old clothes are recommended for field work, as are rain gear and warm clothing when appropriate. Insect repellent is also strongly recommended, and students should check themselves for ectoparasites (i.e. ticks) immediately upon returning from field trips, and shower as soon as possible. Students are also advised to bring along a bottle of water during field trips. ***Sandals and flip-flops are forbidden, and students wearing them will not be allowed to participate on field trips.*** Obviously, failure to participate fully during field labs will adversely affect one's grade.

**Lecture Examinations.** Three (3) equally weighted lecture examinations will be given during the semester, one of these prior to midterm and one during the Final Examination period. Refer to the Course Schedule for tentative exam dates.

**Laboratory Reports.** Students will be required to submit several written laboratory reports and assessments, based upon the results of laboratory exercises, including a quantitative plant community analysis. Formal laboratory reports will be written in the format of a scientific paper. Instructions will be provided for this. *Students will not receive credit for lab reports and assessments for which they were absent.*

**Class Conduct.** Students are expected to comport themselves courteously at all times during lecture and laboratory. Disruptive behavior will not be tolerated, and students behaving in a disruptive manner will be asked to relinquish their VSU student identification card and will be removed from class and referred to the Dean of Students for disciplinary action. Refer to the Student Code of Conduct, Appendix A in the *VSU Student Handbook*. Consumption of food or drink (including water) and wearing of hats or caps is prohibited in the lecture room and in the laboratory. Students should be punctual for all scheduled lecture and laboratory meetings, and, except in situations of emergency, students should not depart from lecture before being dismissed. Students are to direct their full attention to lecture and are to refrain from unwarranted discourse. Behavior contrary to these guidelines is disruptive. Disruptive behavior will result in deduction of points from the final grade.

**Use of Cellular Telephones, Pagers, and Other Such Devices.** Use of cellular telephones, pagers, or any similar remote communication device is prohibited during scheduled lectures or examinations. If students bring cellular telephones or similar devices to lecture, it is their responsibility to switch them off prior to the beginning of the lecture period. Ringing, buzzing, or any other sounds emitted from such devices will be treated as disruptive behavior on the part of the owner/possessor, and the owner/possessor will be asked to leave lecture immediately.

**Academic Integrity.** Students are encouraged to work together and to learn from one another in an appropriate manner. Cooperation between students is especially encouraged in study outside of class. However, students should bear in mind that most work ultimately must be done individually and independently. All examinations, tests, and quizzes are given to students individually and are to be completed independently. Cooperation by students on quizzes, tests, or examinations is prohibited and constitutes cheating. Unless otherwise indicated, quizzes, tests, and examinations are taken strictly from memory without use of textbooks, notes, etc. Unless otherwise indicated, assignments and assessments are to be completed individually and independently. Behavior contrary to these guidelines is prohibited and constitutes cheating. Plagiarism and cheating will not be tolerated and will be prosecuted to the full extent allowed by University policy and the law.

**Plagiarism.** Recognition of and respect for the ownership of property is one of the distinguishing features of civilization. Ideas come from individuals and are effectively owned by their originators; thus, ideas are intellectual property. In the academic sphere, we frequently deal with the ideas of others, most often in published form. As with tangible property, intellectual property is subject to ownership and protection. Moreover, publication establishes ownership of intellectual property. It is essential that we respect the ideas and writing of others and that we scrupulously cite all sources of any and all ideas that are not our own.

*Random House Webster's College Dictionary* (2000) defines **plagiarism** as "the unauthorized use of the language and thoughts of another author and the representation of them as one's own." There are many forms of plagiarism. Perhaps the most blatant form is copying from some other source without citing that source. Other types of plagiarism include using a paper written by another and the improper citation of references. When paraphrasing, the author of the paraphrased material must be properly cited, and, when words are taken directly from another source, their author must be properly cited and the quoted passage must be placed within quotation marks for short quotations or in a separate paragraph with special indentation for longer quoted passages. [See note below on limitations of length for quoted passages.] Plagiarism is theft of intellectual property, and the simplest way to avoid plagiarism is to give credit where credit is due! For your guidance, access to several websites dealing with issues of plagiarism is provided through BlazeVIEW. Also, the following statement from the Writing Tutorial Services website at Indiana University is useful.

To avoid plagiarism, you must give credit whenever you use

- another person's idea, opinion, or theory;
- any facts, statistics, graphs, drawings – any pieces of information – that are not common knowledge;
- quotations of another person's actual spoken or written words; or
- paraphrase of another person's spoken or written words.

<http://www.indiana.edu/~wts/pamphlets/plagiarism.shtml>; Copyright 2004; last updated 27 April 2004

It is imperative that laboratory reports and papers must be the individual student's own original work. Although you will usually be gathering and recording data as a group, each student is required to write up all laboratory reports and papers individually. Cooperation in writing laboratory reports and papers is not allowed and constitutes plagiarism, and similarities in wording will be treated as plagiarism. Plagiarism will not be tolerated, and any student caught plagiarizing shall receive a failing grade on the assignment in question. Please be forewarned that various web search engines will be used to check for plagiarism. *Each student will be required to read the VSU Biology Department's Plagiarism Policy and to sign a form to be kept on file with the department, indicating they have read and comprehend this policy.*

**Students with Disabilities.** Students requiring classroom accommodations or modifications because of documented disabilities should discuss this need with their professor at the beginning of the semester. Disabled students who are not registered with the Special Services Program should contact the Access Office, Farber Hall-South, Telephone 229-245-2498 (V/VP) or 229-219-1348 (TTY).

## Tentative Lecture Schedule with Reading Assignments

[assigned chapters in Smith & Smith, 2001; BV=cf. web links posted in BlazeVIEW]

---

### Week of Jan 10

Introduction to Ecology [[1](#)]  
History, Patterns, & Mechanisms of Evolution  
[[BV](#)]

### Week of Jan 17

*Mon, Jan 17 – MLK Holiday*  
Population Genetics & Mechanisms of  
Microevolution [[19](#), [BV](#)]

### Week of Jan 24

Species, Speciation, & Phylogeny [[BV](#)]

### Week of Jan 31

“Evo-Devo” [[BV](#)]

### Week of Feb 7

Macroevolution [[BV](#)]

### Week of Feb 14

The Physical Environment [[2](#), [3](#), [4](#)]  
Adaptation [[5](#), [6](#), [7](#), [8](#), [9](#)]  
*Exam I – Thurs., Feb 17*

### Week of Feb 21

Ecosystem Productivity [[24](#)]  
Biogeochemical Cycles [[25](#), [26](#)]

### Week of Feb 28

Population Ecology: Demography, Dynamics, &  
Density-dependence [[10](#), [11](#), [12](#)]  
*Thurs, Mar 3 – Midterm Date*

### Week of Mar 7

Population Ecology (cont.) [[10](#), [11](#), [12](#)]

### Week of Mar 14

*Spring Break – Mon-Fri, Mar 14-18*

### Week of Mar 21

Reproductive Ecology & Life Histories [[13](#)]  
*Exam II – Thurs., Mar 24*

### Week of Mar 28

Interspecific Competition [[14](#)]  
Concepts of Predation [[15](#)]

### Week of Apr 4

Predator-Prey Interactions [[16](#)]  
Co-evolution [[17](#)]

### Week of Apr 11

Human Impacts on Populations [[19](#)]  
Community Structure [[20](#)]

### Week of Apr 18

Community Dynamics/Succession [[21](#), [22](#)]

### Week of Apr 25

Landscape Ecology [[23](#)]

### Week of May 2

*Last class day – Mon., May 2*  
*Exam Prep Day – Tues, May 3*  
*Final Examination – Thurs., May 5,*  
*10:15AM-12:15PM*

---

### Tentative Lab Schedule with Assignments and Point Allocation

Week 1 Introduction	
Week 2 Introduction to Inland Coastal Plain Ecosystems (Note: read pp. 12-17; skim Ch. 28-31 + Appendix A for ideas)	Hypotheses (10 points)
Week 3 Phylogenetic Rules and Reconstruction Also, set up experiment on bacterial selection.	Assessment (15 points)
Week 4 Population Genetics Computer Simulations	Assessment/Paper (15 points)
Week 5 Bacterial Selection	Assessment (15 points)
Week 6 Evolution Lab/Discussion	Assessment (10 points)
Week 7 Ecological Transect Sampling I	TBA
Week 8 or 9 TBA	TBA
Week 8 or 9 FIELDTRIP TO SAPELO ISLAND (Fri-Sun, late February or early March)	
Week 10 Analysis of Sapelo Island experimental data	Scientific Paper (35 points)
Week 11 Human Demography	Life Table (15 points)
Week 12 Mark-Recapture and Population Estimation Simulation	Report (25 points)
Week 12-15 Community and/or Behavioral Ecology Field Experiments (TBA)	Scientific Paper (45 points)