

FOUNDATIONS OF BIOLOGY II: ECOLOGY & EVOLUTION

Syllabus: Biology 142, Summer II 2014

Course Instructors: Dr. Rachel Sturge, BS403, rsturge1@umbc.edu
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Required Textbook: *Biological Sciences*, Scott Freeman, Prentice, 5th ed. (students can choose to buy the full textbook, which is also used for BIOL141, or volume 2, which is only used in BIOL142)

Class meeting times:

Lecture: Mon, Wed, Fri, 9-10:15, SHER 003 (Formerly ACIV 004)
Fri 10:30 – 12pm SHER 003 (Formerly ACIV 004)
Module: Mon and Wed, 10:30-12pm, UC 115D

1) Course Objectives:

The goal of this course is to present an important series of topics in organismal biology, including a detailed look at evolution by natural selection, a central unifying principle of biology. We will also study the diversity of life that evolution has produced by studying speciation and phylogeny. Finally, we will learn how these organisms interact with each other and their environment, the science of ecology. An important secondary goal is to promote understanding of science as a process and as an ever-changing body of knowledge that helps us understand the world. Quantitative skills are important in all aspects of evolution and ecology, so the course will also promote overall mathematical and statistical reasoning. Finally, we will use ecology and evolution to understand threats to biodiversity and ecosystems worldwide.

2) Academic Honesty:

All work in this course is covered by UMBC policies on academic misconduct. Any copying, crib noting, assisting others, misusing the clicker system, signing friend's names on assignments they were not present for, etc. will be considered as academic misconduct and strict sanctions will be applied. Strong sanctions will be applied to both students if a student clicks for someone else (the 5% participation points are not worth that risk.) In previous years students have been caught through a variety of methods (including statistical computer matching of exam answers). Do not risk an F in this course or worse.

By enrolling in this course, each student assumes the responsibilities of an active participant in UMBC's scholarly community in which everyone's academic work and behavior are held to the highest standards of honesty. Cheating, fabrication, plagiarism, and helping others to commit these acts are all forms of academic dishonesty, and they are wrong. Academic misconduct could result in disciplinary action that may include, but is not limited to, suspension or dismissal. To read the full "Undergraduate Student Academic Conduct Policy" click on: http://www.umbc.edu/undergrad_ed/ai/

CELL PHONE USAGE IS NOT PERMITTED IN CLASS OR IN DISCUSSION SECTIONS. ANYONE CAUGHT USING ONE MAY BE PENALIZED BY LOSS OF PARTICIPATION POINTS.

3) Assessment:

a) Lecture Participation

Class attendance is mandatory, and prompt arrival is crucial. Students who arrive late should use rear doors and sit near the back. Participation, including in class group work, counts for 10% of the total course grade. During class, students will participate in active learning and a group-based exercises aimed at promoting deeper thinking about the concepts introduced in this course. Many of these exercises will include writing assignments that will be collected and graded for understanding and for participation. More details regarding these exercises will be given out during lectures. Students who miss class due to university-accepted reasons are expected to complete the exercises on their own and turn them in at the start of the next day's lecture for participation credit.

b) Active Learning Discussion Sections (Modules)

Each student is required to attend the active learning (discussion) sections held on Mondays and Wednesdays after lecture in UC115D (the CASTLE). In these discussion sections, you will work on problem sets/exercises in groups and you will hand in your work for grading at the end of the section. Each section will consist of a short quiz that will begin promptly at 10:30am. These quizzes will test your knowledge of the active learning module that will be held that day – **it is your responsibility to ensure that you read the modules BEFORE coming to class each day.** The modules will relate to topics recently covered in lecture, and will provide opportunities to explore the topics in greater detail, discussing the material with your classmates and TAs. Modules will be posted on blackboard under "Course Documents" > "Active Learning Modules". Module activities are to be completed in the active learning sections (and not before class) and each student is responsible for writing down the answers INDEPENDENTLY and turning in their own completed modules at the end of each section. Modules that are accidentally taken home instead of turned in will NOT be accepted late, so please be sure to hand in the correct module each day. Blank printed versions of the module will be provided in the discussion section, so please do not fill out the module beforehand and bring it to class as you will not be allowed to turn it in for credit.

To do well in discussion sections you **MUST** arrive on time. The doors will **close promptly at 10:30am and will not reopen until after the quizzes have been complete.** At that time, anyone who is late will be allowed to enter, but will not be able to take the quiz. The doors will close for the final time at 10:45am. **Any students arriving after 10:45am will not be allowed to enter the discussion section** and will receive a 0 for the module unless they are able to provide a legitimate, university accepted excuse for their tardiness. Please note that regular traffic or commuting issues are NOT considered a legitimate excuse. If you miss a module due to a university accepted reason, you will be allowed to make up the module on your own and **turn it in at the START of the next lecture** (this means Mon., Wed. or Fri. at 9am and not in the discussion section.) Please note that to be allowed to make up a module, you **MUST** provide documented proof of your absence. If you are ill, this means you must have a doctor's note to support your absence. We will not accept late modules for unexcused absences or for students who failed to turn it in at the end of the discussion section. If you aren't sure if your absence is excused or unexcused, please contact your Instructors to find out. The lowest module score will be dropped from the final grade, so students who have one unexcused absence can still earn full credit for discussion.

c) Exams

There will be three exams, held every other Friday at 9am in SHER 003. All exams will consist of two sections: 1) multiple choice questions; 2) short answer. **Exam questions will be based on material from lecture and active learning modules.** All three of these exams count towards your final grade. There will be NO cumulative final exam. If you miss an exam due to a university-accepted reason you must contact the instructors as soon as possible to arrange a makeup exam. The makeup exams will consist entirely of short answer questions, again based on lecture and discussion section material. All exams will start on time, and all students are expected to arrive in a timely fashion. No students will be allowed to leave the exam before 9:30am and **students who arrive after 9:30am will NOT be allowed to take the exam.** If you are late for a legitimate reason, please contact the instructors to arrange to take the makeup exam – again traffic and commuting problems are NOT considered a legitimate reason. Any students taking the makeup exam are **expected to bring documented proof of their absence to the exam.** Any students who fail to do so may not be allowed to take the exam.

Students who take exams in Student Support Services must email the instructors at least 24 hours before **each exam** to confirm the arrangements. Exams must be taken at the same time as the rest of the class – this means you must start the exams early if you require additional time, as lecture will take place at 10:15am on the day of exams. If you are unable to arrange to take the exam at the same time as the rest of the class, you MUST contact the Instructors at least **24 hours prior to the exam** to arrange to take the makeup exam instead. Makeup exams should be taken on the same day as the regular exam, but may be taken Friday afternoons after class is finished.

d) Class assignments

In addition to the lecture participation exercises that will count towards your participation grade, there will be three class assignments, held every other Friday during lecture in SHER 003. These exercises will be done in groups, but **each student is responsible for writing down the answers INDEPENDENTLY and turning in their own completed assignments.** Students who miss class for legitimate reasons will be allowed to make up these assignments, which will be posted to blackboard under “Course Documents” > “In-class assignments”. Make up exercises will be **due at the start of class on Mondays at 9am** and documented proof of the absence must accompany the makeup work. Work may also be submitted by email provided that you submit it by the 9am deadline.

5) Grading:

Over the course of the session we will evaluate your performance with active learning modules, in class exercises and three exams. We will also grade your participation based on clicker usage and participation in group discussion. The points possible in each category are distributed as follows:

Category	Percent
Exams (3 exams worth 20% each)	60%
Active Learning Modules (11 modules, lowest is dropped)	20%
Class Assignments	10%
Class Participation	10%

To calculate your weighted grade, use this formula to sum up the four parts of your grade:
 $(\% \text{ average on three midterms} \times 0.60) + (\% \text{ active learning points [remember your lowest score is dropped]} \times 0.20) + (\% \text{ of in class assignments} \times 0.10) + (\% \text{ total participation points} \times 0.10)$

Grade Cutoffs:

Letter Grade	Percent Needed
A	90% to 100%
B	80% to 89%
C	70% to 79%
D	60% to 69%
F	0% to 60%

To help you track your progress, we will post your scores and the percentage of points you have earned to date in an electronic grade book on our Blackboard course homepage. *Please note that blackboard computes a “total grade” that is NOT the correct weighted average that your grade will be based on. Thus, use it only as a very rough guide for your own purposes.*

One week “Statute of Limitations”: All grading questions about exams, active learning sessions or participation points must be addressed within one week of the scores being posted to blackboard or handed out in class. Thus, you should check your grades regularly. If your question pertains to problems with your clicker (turning point technology), please re-read the above section [3] Assessment, a) Lecture Participation and Turning Technology Clickers] BEFORE contacting your instructors.

6) Tips for excelling in this class:

STUDYING: The exams will emphasize material that we have covered in lecture and in discussion section. The main objective of the reading assignments is to help you understand the topics covered during the lecture. A good strategy for success in the course includes the following:

1. **Careful Notes:** Take notes during the lecture, emphasizing material that is written or presented in figures, but also jotting down material presented verbally.
2. **Study Groups:** Students that form and participate in serious study groups do best in this course. Check your notes each night for concepts you did not fully understand. Later, compare notes with a few other students in a study group and discuss problem areas.
3. **Understand and Memorize:** Make sure that you UNDERSTAND each of the topics discussed. Memorizing everything in the notes is not sufficient to do well in this course. Some exam questions will test your conceptual understanding. You must also memorize the notes as well (e.g., lists, definitions), as both are necessary to do well in this course.
4. **Keep Up Each Week:** Each weekend learn the material presented in lecture well. Really study the notes thoroughly. Understand and memorize lists, definitions, key concepts. Make appointments to see the TAs or the instructors if you have questions.
5. **Studying for Exams:** First study and memorize your notes alone, then work with your study group. Prior to exams one helpful strategy is to recopy your notes, or at least make a detailed outline emphasizing sections that you had trouble with. Learn your lecture notes well. Test yourself by trying to write out lists from memory and drawing figures from memory. Do practice problems in the ecology and genetics section and practice tree thinking and tree drawing exercises for the phylogeny section. Don't just look your notes over. Make sure what you are learning makes sense to you.

6. **Ask Questions in Class/Discussion:** If you are having difficulties grasping a concept and want clarification, chances are very good you are not the only one! Please ask your instructors/TAs. If you are not comfortable speaking out in class, please seek us out after the lecture/discussion.

IF YOU DO POORLY ON AN EXAM: For each question try to figure out why you got it wrong.

- 1) UNDERSTANDING – you failed to understand the concept well. Interpreting a graph, inferring ancestral characteristics on a tree, applying a formula etc. may only require understanding.
- 2) MEMORIZATION – you failed to memorize an important piece of information. You forgot a definition, could not remember the association taught, or the difference between A and B.
- 3) QUESTIONS – you really feel that you understood and memorized the material, but you were thrown off by the question. You need to practice our multiple-choice exams more. Also, make sure you are well rested for exams so able to read difficult questions carefully, and that you are able to think well on your feet. Cramming generally does not work very well in any course and perhaps this course especially.

Each of the above problems requires a different solution. Reread the study advice above to address the problem that you had. Often, you may need to put in more time studying. If you do the work, this can be a straightforward, fun and interesting class.

Schedule & Assigned Readings

BIOL142: Foundations of Biology II – Ecology & Evolution

Instructors: Dr. Rachel Sturge and Dr. Nandadevi Cortes Rodriguez
Lectures: Mon and Wed 9:00 – 10:15am; Fri 9:00 – 12:00pm SHER 003
Discussion Modules: Mon and Wed, 10:30 – 12:00pm UC115D

Readings from “Biological Science”, Scott Freeman, Prentice Hall Publishers

<u>Lecture #</u>	<u>Date</u>	<u>Day</u>	<u>Topic</u>
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<u>Lecture #</u>	<u>Date</u>	<u>Day</u>	<u>Topic</u>
PART 1 - INTRODUCTION TO EVOLUTION: PROCESSES AND MECHANISMS			
1	07-Jul	Mon	Origins of Life and Intro to Evolution
2	9-Jul	Wed	Mechanisms of Evolution
3	11-Jul	Fri	Selection and Hardy-Weinberg Equilibrium
4	14-Jul	Mon	Species Concepts
5	16-Jul	Wed	Mechanisms of Speciation

<u>Lecture #</u>	<u>Date</u>	<u>Day</u>	<u>Topic</u>
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PART 2 - ECOLOGY: INTERACTIONS AMONG ORGANISMS

6	18-Jul	Fri	EXAM 1 Intro to Ecology
7	21-Jul	Mon	Individual Ecology
8	23-Jul	Wed	Population Ecology
9	25-Jul	Fri	Community Ecology
10	28-Jul	Mon	Biogeography and Biomes
11	30-Jul	Wed	Ecosystems and Conservation Biology

PART 3 – EVOLUTIONARY HISTORY: PHYLOGENY & DIVERSITY

12	01-Aug	Fri	EXAM 2 Phylogenies and Trees
13	04-Aug	Mon	Building and Using Trees
14	06-Aug	Wed	Primate Evolution
15	08-Aug	Fri	Vertebrate Evolution
16	11-Aug	Mon	Animal Evolution
17	13-Aug	Wed	Tree of Life
18	15-Aug	Fri	EXAM 3