Biology 204 – Evolution, Ecology and Biodiversity Fall 2012

Instructor: David Hooper

Contact info: Office: Biology 307 Phone: 650-3649 Email: hooper@biol.wwu.edu Lecture meets: 10-10:50 MWF, Biology 234

Labs meet: Biology 249, T 8-11 (40653); T 11-2 (40654); F 11-2 (40655); F 2-5 (40744)

Office Hours: M 3-4, W 11-12, or by appointment

Web site: see Blackboard for posting of all class materials

Texts. 1) Freeman, Biological Science, 4th or Custom Edition (REQUIRED). 2) Biology 204 Lab Manual (REQUIRED). 3) Knisely, K. (2005) A Student Handbook for Writing in Biology, 3rd Edition (REQUIRED), 4) Van De Graaf, K.M. and J.L. Crawley, A Photographic Atlas for the Biology Laboratory, 5th or 6th Edition (optional). Keeping up with the reading assignments will be critical to your success in this class. You are expected to read the assigned chapters *prior to* lecture. I highly recommend that you do the Web/CD activities scattered throughout the book and study the relevant parts of the "Summary of key concepts" and "Questions" sections at the ends of chapters.

COURSE GOALS

- 1. Content: Introduce the diversity of life, ecology, and evolutionary biology in an integrated way;
- 2. Content and Skills: Introduce and practice the scientific method (by doing);
- 3. Skills: Introduce some basic tools of biology (lab);
- 4. Skills: Communicating science in written and oral forms (writing scientific papers, giving presentations; lab)
- 5. Skills: Quantitative reasoning (i.e., using math to answer biological questions).

COURSE GRADE

1. Your grade will be based on a total of approximately 510 possible points, of which the lab is 1/3:

Lecture (340 points)	
3 midterms - 60 points each	180 points
6 quizzes – 10 points each	60 points
Final exam (comprehensive, required)	100 points
<u>Lab (170 points)</u>	
Lab assignments and quizzes	80 points
Excel Tutorial	10 points
Scientific Paper Reading Assignment	10 points
Lab reports (Sehome Hill, mycorrhizae)	40 points
Lab practical	30 points
	510 points total

2. Exams.

Midterm I – <u>F. 10/12</u>; Midterm II – <u>F. 11/2</u>; Midterm III – <u>W. 11/28</u>; Final – <u>T. 12/11, 10:30-12:30 a.m.</u> Exams will be multiple choice. The final exam is comprehensive. Make-up exams are allowed only with a valid, *pre-approved* excuse and will have different questions from the original exam. Regrades: If you feel I have made an error in grading your test, please bring it to my attention. Regrades must be brought to me <u>no later than one</u> week after the test is returned.

- 3. Late Assignments will lose 10% of the possible points per day late.
- 4. Extra credit: You can earn a MAXIMUM 10 POINTS that will be added to your raw point total. I want to encourage you to attend activities or read articles related to this course outside of class. You can earn up to 10 points by writing a summary (two typed, double-spaced pages) of a course-related seminar, journal article, or article written for the popular press. The summary must use relevant biological concepts from class to explain the talk/article summarized. The number of points you earn will depend on the quality and thoughtfulness of your written summary. You will need to do a very good job to get all ten points. See the BlackBoard site for details on write-up format and questions.
 - Unless it is an assignment I give, you must check with me about suitability prior to undertaking the extra credit. Potential extra credit topics include field trips, guest lectures, and articles.
 - Extra credits are due no later than one week after the activity.
 - You can write only one extra credit assignment. If you decide to do one, do a good job and make it count!

5. Academic dishonesty will not be tolerated. Assignments with plagiarism problems can result in no credit, failing the class, or expulsion from Western. Remember - it is YOUR RESPONSIBILITY to know about the issues involved. Questions about plagiarism? Ask me, your TA, and/or see the following excellent resources: http://www.libguides.wwu.edu/plagiarism and http://www.edu/soc/docs/plagiarism.pdf.

6. **Backwards days.** Extensive education research shows that students learn best when they learn actively. Backwards Days will be "backwards" because, rather than me standing up and lecturing, then giving take-home exercises, you will be responsible for going over the reading and lecture material <u>before</u> class, then spending part of the class working actively together on in-class homework. The goal is to make sure that, in addition to knowing terms and understanding concepts, you are comfortable <u>applying</u> these ideas to new situations, using them to <u>analyze</u> problems, <u>synthesizing</u> multiple ideas, and <u>critically evaluating</u> a variety of scientific evidence. That's what science is really all about! See "Bloom's taxonomy of learning" in Lecture 1.

7. **How to succeed in this class:** Suggestions a-e are a MINIMUM. If you don't do them, it's unlikely that you will get a good grade in Biology 204. Suggestions f-h are strategies that have helped many students in the past.

- a) Come to lecture. Powerpoint files are to provide figures in a format in which it's easy to take notes, not to replace lecture. If you have to miss a class, make sure you have someone who can take good notes for you.
- b) Take notes: If I say it in class, or draw it on the board, I expect you to understand that material (unless I explicitly state otherwise);
- c) Keep up with the reading. The textbook is very good and serves as an important resource. Some required material is ONLY presented in the textbook. Read the assigned chapters before lecture and lab, then reread them afterwards.
- d) Ask questions: If you don't understand something, others may not either.
- e) Start early on the study guides, so you don't have to cram. These will be updated ~1 week before the tests, but you can start working on them immediately, as I expect only minor changes.
- f) Do the review questions at the back of the chapter and other activities (e.g., online exercises) to help you solidify your learning.
- g) If you really don't understand something, come to office hours (preferably BEFORE you get your test back). Office hours are a good time to explore questions for which there may not be time in class. If you can't make the regular times, drop me an email to schedule a time that will work for both of us.
- h) Study in groups: work with people who have similar high standards to your own, and force each other to give clear, complete, and concise answers to study guide and text book questions. The best way to show that you know something well is being able to explain it to someone else.

	0	D.	07.00.0			D		г	0.50.0
		\mathbf{R}^+	87-89.9	C+	//-/9.9	D+	67-69.9	F	0-59.9
Α	93-100	В	83-86.9	С	73-76.9	D	63-66.9		
A-	90-92.9	B-	80-82.9	C-	70-72.9	D-	60-62.9		

8. Your final grade will be determined as a percentage of the point total:

Lecture schedule

Readings listed are chapters in the 4th edition of the textbook, with selected pages following the colon; pages in the custom edition are the same. Other editions will vary. Lab exercises are numbered as in the 204 Lab Manual. NOTE: labs are due to your TA on your assigned lab day. Some assignments are done in class and others outside of class. **Dates** Lecture Topics Reading Lab exercises

Wook 1	Lecture ropies	Reading	Lab CACI CISCS
<u>week I</u>			NT 1.1
9/26	Introduction to the course: eco/evo overview		No lab
9/28	The process of science	1	
Week 2			
10/1	Evolution vs. "intelligent design"; Evolution by natural selection	24	Lab 1 – PoS
			Due: Excel, 1.1
10/3	Evolution by natural selection (Backwards)	24	
10/5	The basis for evolution: the cell cycle, meiosis; Quiz 1	11: 194-200	
		12: 211-220	
Week 3			
10/8	Meiosis, continued; Mendel and the gene	12: 220-227	Lab 2 – Sehome I
	, , , , , , , , , , , , , , , , , , ,	13: 230-236	Due 2.1
10/10	Mendel and the gene (<i>Backwards</i>)	13: 236-250	
10/12	Midterm #1 (Intro – Mendel)		
Week /			
$\frac{WCCK +}{10/15}$	Evolutionary processes	25	Lah 3 Sehome II
10/13	Evolutionary processes	25	Lao 3 - Scholle II
10/17	Evolutionary processes (<i>Backwaras</i>)	25	Due: 2.2, 5.1
10/19	Speciation; Quiz 2	26	
Week 5	~		
10/22	Speciation, Phylogenies and the history of life	26, 27	Lab 4 - NatSel
10/24	Phylogenies (Backwards)	27	Due: 3.2, 4.1
10/26	Diversity of life: Bacteria and Archaea; Quiz 3	28	
Week 6			
10/29	Diversity of life: Bacteria and Archaea; Protists	28, 29	Lab 5 - BAP
10/31	Diversity of life: Protists (Backwards)	29	Due: 5.1, 5.2
11/2	Midterm #2 (Evol. processes – Protists)		
Week 7			
11/5	Diversity of life: Plants 1	30	Lab 6 - Plants
11/7	Diversity of life: Plants 2 (Backwards)	30	Due: 6.1. 6.2
11/9	Diversity of life: Fungi 1: Ouiz 4	31	2 400 002, 002
Week 8	Diversity of me. I ungi 1, Quil 1	51	
$\frac{11}{12}$	VETERAN'S DAV NO CLASS		
11/12 11/14	Diversity of life: Fungi 2	31	Lob 7 Fungi
11/14	Diversity of life, Animala 1: Quiz 5	22	Duce 71 72 73
11/10 Wash 0	Diversity of me: Animais 1; Quiz 5	52	Due: 7.1, 7.2, 7.5
<u>week 9</u>	\mathbf{D}^{\prime}_{1} and \mathbf{f}_{1}^{\prime} for Animals 2	20	NJ. 1. L
11/19	Diversity of life: Animals 2	32	NO IAD
11/21	Introduction to Ecology	50	
11/23	THANKSGIVING – NO CLASS		
Week 10			
11/26	Introduction to Ecology, Population ecology	50, 52	Lab 8 - Animals
11/28	Midterm #3 (Plants – Ecol. Intro)		Due: 8.1, 8.2
11/30	Population ecology 1	52	
Week 11			
12/3	Population ecology 2 (Backwards)	52	Lab practical
12/5	Ecosystem ecology 1	54	Due: 7.4
12/7	Ecosystem ecology 2; Quiz 6	54	
Week 12			
T 10/10			

T 12/13 Final Exam, 10:30-12:30 a.m.

Laboratory Schedule

The laboratory section of this course complements the lecture and is intended to give you hands on experience learning about organismal diversity, evolutionary trends, and ecological concepts. You are expected to have reviewed the material in the lab manual and textbook *before* lab, as well as doing pre-lab assignments where applicable. This is critical for you to both understand the lab material and to get through the labs in an efficient manner. Bring your lab manual to every lab; bring the lab photo atlas (if you have it) and textbook to <u>all biodiversity</u> labs. Readings listed are related chapters in the Freeman textbook and are <u>in addition to</u> the Exercise sections listed from the lab manual.

Dates	Laboratory Topics	Reading
Week of Sept. 24 (1)	No Lab the first week of classes; Excel Tutorial assigned in lecture	
Week of Oct. 1 (2)	Ex. 1.1: Process of Science	1
<u> </u>	Ex. 1.2: Mycorrhizae Experiment setup	31
	Due: Excel Tutorial; Due in class: Assignment 1.1	
Week of Oct. 8 (3)	Ex. 2: Sehome Hill Forest Study – gather data	54
<u> </u>	Due in class: 2.1	
Week of Oct. 15 (4)	Ex. 3: Sehome Hill Forest Study – analyze data	54, Knisely,
	Due: 2.2-Scientific Paper Reading; Due in class: 3.1	Journal article
Week of Oct. 22 (5)	Ex. 4: Natural Selection and Genetic Drift	25
	Due: 3.2-Sehome Hill Results Section; Due in class: 4.1	
Week of Oct. 29 (6)	Ex. 5: Biodiversity I – Bacteria, Archaea, & Protists	12, 28, 29
	Due: 5.1; Due in class: 5.2	
Week of Nov. 5 (7)	Ex. 6: Biodiversity II – Plants	30
	Due: 6.1; Due in class: 6.2	
Week of Nov. 12 (8)	Ex. 7: Biodiversity III - Fungi	31
	Due: 7.1; Due in class: 7.2, 7.3	
Week of Nov. 19 (9)	THANKSGIVING WEEK – NO LAB	
Week of Nov. 26 (10)	Exercise 8: Biodiversity IV - Animals	32-34
	Due 8.1; Due in class: 8.2	
Week of Dec. 3 (11)	Lab practical	
	Due: 7.4	