

## Biology 204 – Evolution, Ecology and Biodiversity Fall 2009

**Instructor:** David Hooper

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**Class meets:** 12-12:50 MWF, Biology Rm. 234      **Labs meet:** T 11-2 (41187); T 2-5 (41188); W 2-5 (41373)

**Office Hours:** W 1-2, F 1-2, or by appointment

**TA's:** (Tues. labs)      email:  
(Wed. lab)      email:

**Web site:** <http://fire.biol.wvu.edu/hooper/courses.html>

**Texts.** Freeman, Biological Science, 3<sup>rd</sup> Edition (REQUIRED). Biology 204 Lab Manual (posted on web). Van De Graaf, K.M. and J.L. Crawley, A Photographic Atlas for the Biology Laboratory, 5<sup>th</sup> Edition (REQUIRED). Knisely, K. (2005) A Student Handbook for Writing in Biology, 2<sup>nd</sup> Edition (REQUIRED). 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 scientific methods (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 375 possible points, of which the lab is 1/3:

#### Lecture (240 points)

3 midterms - 70 points each (drop lowest)      140 points

Final exam (comprehensive, required)      100 points

#### Lab (120 points)

10 Lab assignments      50 points

Pop quizzes      15 points

Excel Tutorial      10 points

Scientific Paper Reading Assignment      10 points

Lab report I (Sehome Hill)      20 points

Lab practical      30 points

375 points total

2. **Exams.**

Midterm I – F, 10/9; Midterm II – F, 10/30; Midterm III – F, 11/20; Final – F, 12/11, 10:30-12:30 a.m.

Exams will be multiple choice and short answer. You can drop your lowest midterm grade, but must take the comprehensive final exam. Make-up final 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 no later than one 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 web 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. Questions about plagiarism? Ask me, the TA, and/or see Western’s web site: <http://www.library.wvu.edu/ref/plagiarism.html>.

**6. H1N1 virus preparation.**

Goals:

- 1) Avoid sickness;
- 2) Avoid course withdrawals.

We can accomplish both at once by taking the following steps:

- a) Don’t spread it around. If you are sick with the flu, please **DO NOT** come to class until you are fever-free (without medications) for at least 24 hours.
- b) Stay registered for the class. If you have to miss several days (up to seven consecutive weekdays) because of flu-related illness, please notify me in writing by email, and I will be sure you have access to all necessary materials. If you have to miss a test because you are sick, then that will be the test grade that you drop;
- c) Be prepared.
  - i. Make sure you have someone who can take good notes for you in class.
  - ii. Wash your hands thoroughly before and after lab, and before and after using any common equipment (e.g., computers, microscopes).
  - iii. Stay up to date with course reading and assignments so that if you do get sick, you don’t get impossibly behind.

**7. Your final grade** will be determined as a percentage of the 375 point total:

	B+	87-89.9	C+	77-79.9	D+	67-69.9	F	0-59.9
A	93-100	B	83-86.9	C	73-76.9	D	63-66.9	
A-	90-92.9	B-	80-82.9	C-	70-72.9	D-	60-62.9	

### Lecture schedule

Readings listed are chapters in the textbook, with selected pages following the colon. Lab exercises are numbered as in the 204 Lab Manual. NOTE: labs are due in class on your assigned lab day.

<b>Dates</b>	<b>Lecture Topics</b>	<b>Reading</b>	<b>Lab exercises</b>
<u>Week 1</u>			
9/23	Introduction to the course: eco/evo overview		No lab
9/25	The process of science; Evolution vs. "intelligent design"	1	
<u>Week 2</u>			
9/28	Evolution by natural selection	24	
9/30	The basis for evolution: the cell cycle, meiosis	11: 222-3, 227-31	1, 2
		12	<b>Due: Excel, 1, 2</b>
10/2	Meiosis, continued; Mendel and the gene	12, 13: 265-76	
<u>Week 3</u>			
10/5	Mendel and the gene	13: 265-76	3
10/7	Evolutionary processes	25	
10/9	<b>Midterm #1</b> (Intro – Mendel)		
<u>Week 4</u>			
10/12	Evolutionary processes	25	
10/14	Speciation	26	3
10/16	Speciation, Phylogenies and the history of life	26, 27	<b>Due: 3, reading</b>
<u>Week 5</u>			
10/19	Phylogenies	27	4, 5, 6
10/21	Diversity of life: Bacteria and Archaea	28	<b>Due: Sehome results</b>
10/23	Diversity of life: Bacteria and Archaea; Protists	28, 29	
<u>Week 6</u>			
10/26	Diversity of life: Protists	29	7
10/28	Diversity of life: Plants 1	30	<b>Due: 4, 5, 6</b>
10/30	<b>Midterm #2</b> (Evol. processes – Protists)		
<u>Week 7</u>			
11/2	Diversity of life: Plants 2	30	8
11/4	Diversity of life: Fungi	31	<b>Due: 7</b>
11/6	Diversity of life: Fungi	31	
<u>Week 8</u>			
11/9	Diversity of life: Animals	32	Pred-prey take home
11/11	VETERANS' DAY – NO CLASS		<b>Due Friday</b>
11/13	Diversity of life: Animals	32	
<u>Week 9</u>			
11/16	Introduction to Ecology	50	9
11/18	Population ecology	52	<b>Due: 8</b>
11/20	<b>Midterm #3</b> (Plants – Ecol. Intro)		
<u>Week 10</u>			
11/23	Population ecology	52	
11/25	THANKSGIVING – NO CLASS		
11/27	THANKSGIVING – NO CLASS		
<u>Week 11</u>			
11/30	Community ecology	53	<b>Lab practical</b>
12/2	Ecosystem ecology	54	<b>Due: 9</b>
12/4	Ecosystem ecology	54	
<u>Week 12</u>			
<b>F 12/11</b>	<b>Final Exam, 10:30-12:30 a.m.</b>		

## 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. This is critical for you to both understand the lab material and to get through the labs in an efficient manner. There will be periodic quizzes to test your understanding of this material. Bring your lab manual to every lab; bring the lab photo atlas and textbook to all biodiversity labs. Readings listed are related chapters in the Freeman textbook and are in addition to the Exercise sections listed from the lab manual.

<b>Dates</b>	<b>Laboratory Topics</b>	<b>Reading</b>
<u>Week of Sept. 21 (1)</u>	No Lab the first week of classes; Excel Tutorial assigned in lecture	
<u>Week of Sept. 28 (2)</u>	Exercise 1: Process of Science Exercise 2: Natural Selection and Genetic Drift Hand out Scientific Paper Reading Assignment <b>Due: Excel Tutorial; Due in class: Exercises 1 &amp; 2</b>	25 27
<u>Week of Oct. 5 (3)</u>	Exercise 3: Sehome Hill Forest Study – gather data	54
<u>Week of Oct. 12 (4)</u>	Exercise 3: : Sehome Hill Forest Study – analyze data <b>Due: Scientific Paper Reading; Due in class: Exercise 3</b>	54, Knisely, Journal article
<u>Week of Oct. 19 (5)</u>	Exercise 4: Microscopy Introduction Exercise 5: Biodiversity I: Life cycles Exercise 6: Winogradsky Column Demonstration <b>Due: Sehome Hill Results Section</b>	12 28
<u>Week of Oct. 26 (6)</u>	Exercise 7: Biodiversity II – Primary Producers <b>Due: Exercises 4, 5, 6</b>	29, 30
<u>Week of Nov. 2 (7)</u>	Exercise 8: Biodiversity III: Decomposers <b>Due: Exercise 7</b>	28, 31
<u>Week of Nov. 9 (8)</u>	Predator – Prey Take Home Lab (Veteran’s Day week) <b>Due Friday</b>	53
<u>Week of Nov. 16 (9)</u>	Exercise 9: Biodiversity IV: Consumers <b>Due: Exercise 8</b>	28, 31-33
<u>Week of Nov. 23 (10)</u>	THANKSGIVING WEEK – NO LAB	
<u>Week of Nov. 30 (11)</u>	<b>Lab practical</b> <b>Due: Exercise 9</b>	