

BIO 171: INTRODUCTORY BIOLOGY: ECOLOGY & EVOLUTION
Dr. Josephine Kurdziel (12 and 1pm lectures)
Winter 2012 Schedule

COURSE OVERVIEW:

Biology is a fascinating and diverse field. This course is intended for students who plan to major in one of the many biology concentrations available or who plan to go into the health professions or teaching. It is open to anyone seeking a rigorous overview of the major themes and ideas in ecology, genetics, and evolution.

COURSE GOALS:

Upon completion of the course, students will be able to do the following:

- ❑ Develop a robust understanding of how science works and improve their scientific reasoning skills;
- ❑ Explain key concepts in ecology, genetics and evolutionary biology and evaluate how the interactions of ecological, evolutionary and genetic processes influence current, historical and future patterns of biodiversity;
- ❑ Explain the relevance of biological phenomena to their lives and apply biological principles to make informed decisions.

COURSE PHILOSOPHY:

Biology is fascinating and extremely relevant to your daily life – and if you don't agree with this statement, we hope to *change* your views. We have designed this course in part to share with you the intriguing research that biologists have produced, and partly in response to dissatisfaction with the way introductory biology courses have traditionally been taught. Biology should not be taught as if it were only a compendium of facts with little left to discover. An introductory biology course should expose you to the ways that biologists explore questions about the natural world, drawing on the latest research, and let you experience that sense of personal discovery for yourself. In this course, you will not be graded on your ability to memorize isolated facts, but you will be coerced into thinking deeply about important biological concepts. Through readings, class discussions, web explorations, and writing assignments, you will learn the major ideas and approaches of biology. We believe that each individual learns by constructing his or her own understanding, and we feel that this process is enhanced when you discuss new ideas with your peers, the graduate student instructors/undergraduate teaching assistants (GSIs/UTAs) and the course instructor. Sharing your ideas and responding to the ideas of others improves your thinking and deepens understanding.

Because this philosophy guides our approach to the course, we will use collaborative learning techniques throughout the course (both in lecture and in the smaller discussion sections). We want this class to be interesting and challenging for each of you. We hope that it stimulates your curiosity about the living world around you and fosters confidence in your abilities to find, apply, synthesize, and evaluate scientific information throughout your life.

INSTRUCTOR CONTACT INFORMATION:

Dr. Josephine P. Kurdziel

Phone: 763-3684

Email: josephak@umich.edu

Office: Natural Sciences building (aka Kraus) room 1139

Office Hours: Tuesdays, 3:30-4:30 pm, Wednesdays, 2-4 pm or *by appointment*

COURSE COORDINATOR CONTACT INFORMATION:

Dr. Laura Eidietis

Office: USB building room 4138f

Office Hours (for administrative purposes): Wednesdays 11 am-12 pm or *by appointment* held in SLC alcove

Email: leidieti@umich.edu

GRADUATE STUDENT INSTRUCTOR (GSI) CONTACT INFORMATION:

A master list of GSI/UTA office hours will be available shortly and will be posted on *CTools* and in the SLC, the Science Learning Center, located in the Atrium area of the Chemistry building (room 1720). All GSIs/UTAs will hold their office hours in the SLC alcoves. *You may attend any and all GSI/UTA office hours, not just those of the individual who teaches your discussion section.*

COURSE WEBSITE, TEXTBOOK, READINGS & LECTURETOOLS:

The course website will be available through *CTools*; the URL is:

<https://ctools.umich.edu/portal>

You will need your unickname and password to access resources on the course website. Click on the tab for BIO 171 W12; all lecture sections will use a common *CTools* site. All supplemental reading materials for lectures and discussion will be posted on the course website and class announcements will be posted frequently, so please check the website at least three times per week. The PowerPoint presentations from lecture and other resources (such as research articles, discussion materials, exams from Winter 2011) will also be available on the website.

The *required* textbook is *Biological Science* (2010, fourth edition preferred) by Scott Freeman (the publisher is Pearson Education, Inc.). You may purchase the textbook (new or used) from Ulrich's, Michigan Book & Supply, or Michigan Union bookstores. You may also purchase the book from *Amazon.com* or other online vendors (often cheaper than university bookstores). In addition to readings in the textbook, there will be a number of "articles" from science research journals and science magazines. These articles will be available through *CTools* website (under the "Resources" link). No other textbooks are required (the *Mastering Biology* online quizzing system offered by some of the bookstores is not required, but it comes packaged free with new copies of the textbook). The exams draw primarily from material presented in lecture and activities completed in discussion sections.

All students should bring their laptop or cell phone to every lecture. *LectureTools* is an interactive audience response system that Dr. Kurdziel will be using to help you learn biology concepts and to make the large class more interactive. Instead of purchasing a "clicker", we will use laptops or cell phones that you already own combined with software called "*LectureTools*" (designed by Perry Samson @UM) that you will access through a link in *CTools*.

LectureTools not only allows you to answer a diversity of question types (multiple choice, short essays, image-based questions) that the instructor poses but it also allows you to take notes electronically, write questions to GSIs during lecture and receive answers, and rate how well you understand the information presented on each slide so that you can go back and review your individualized notes after class. *LectureTools* saves all your personal notes on a server so you can save paper/printing costs and not worry about laptop crashes.

To access *LectureTools*, you should go to the BIO 171 *CTools* site. Students registered for the noon lecture section should click on the link called “*LectureTools*” at the beginning of each lecture. Students registered for the 1pm lecture section should click on the link called “*LectureTools 1pm Lecture*” at the beginning of each lecture period. Please read the help file if you have never used *LectureTools* before.

GRADE DETERMINATION:

We hope that you will take full advantage of working collaboratively to learn biology. Your final grade will be determined by the percentage of the total number of points accumulated from four lecture exams, two writing assignments, as well as discussion preparation, attendance, quizzes, and participation. You should attend class regularly and participate fully in all activities to do well in this course. **We do not give extra credit assignments later in the semester.**

EVALUATION	POINTS	PERCENT OF TOTAL POINTS
Lecture Exams	400 (4 at 100 points each)	79.52 %
Discussion Preparation & Participation	33 (3 points/week x 11 weeks) top 11 (out of 12) scores	6.56 %
Writing Assignments	60 (proposal 20 points & final essay 40 points)	11.93 %
Surveys	10	1.99 %
Total	503 points	100 %

GRADING SCALE

A range = 453 – 503 points; 90-100 %

B range = 403 – 452 points; 80-89 %

C range = 353 – 402 points; 70-79 %

D range = 302 – 352 points; 60-69 %

E range = < 302 points; <60 %

EXAM DATES

Exams will be given at the following times:

Exam I 100 points, Wednesday, January 25, 6:00–8:00 PM

Exam II 100 points, Wednesday, February 22, 6:00–8:00 PM

Exam III 100 points, Wednesday, March 28, 6:00–8:00 PM

Exam IV 100 points, Tuesday, April 24; 7:00–9:00 PM

The dates for lecture exams *are scheduled months in advance*, so please make sure that you are not planning to be out of town on these dates and mark them on your calendar now! **We do not make accommodations for class conflicts. You must keep Wednesday from 6-8 PM open for Biology 171 exams.** If you have a specially scheduled evening exam that conflicts with a Biology 171 exam, please contact the Course Coordinator within the first 3 weeks of the term. Students with learning disabilities or those who need special accommodations for taking the exams should make those clear to the Course Coordinator early in the semester. Students requiring special accommodations should provide the Course Coordinator with forms from the Office of Services for Students with Disabilities [SSD] within the first 3 weeks of the term.

Exams will be a combination of multiple choice (~30) and short answer (~4 to 5) questions and will cover both lecture and discussion material. Room assignments for the exam will be announced in lecture and posted on *CTools* a few days before each exam date.

COURSE POLICIES:

Attendance Policy:

We expect you to attend lecture and your weekly discussion section. It is in your best interest to arrive on time and attend every class meeting. Because this is designed to be an interactive class, where we discuss the readings and pose questions, we expect that you have completed the readings and thought about the content *before* you come to each discussion section.

During each class period, we will focus on putting the readings into context, we will explore ideas that are difficult to understand by reading alone, and we will introduce and reflect on discussion activities and participate in group/class discussions. We expect you to participate actively in all lecture and discussion activities and part of your grade will be based on your class participation (see Grade Determination section on page 3). Science education research has demonstrated that students who take an active role in their learning learn more and retain that knowledge longer; therefore, it is in your best interest to prepare for and actively participate in every class meeting. *Students who fail to show up for the first discussion section meeting or who miss two consecutive discussion sections may be withdrawn from the class to make room for students on the wait list.* If you know you are going to miss this first discussion meeting, or if you have any other scheduling problem, contact the Course Coordinator immediately.

Make-up Policy:

Due to the interactive nature of this class, no make-ups of discussion activities are possible. In the event of verifiable illness or other emergency, your GSI may substitute other assignments in lieu of missed discussions. *If problems arise that interfere with your ability to do the work in this class, please tell us as soon as possible.*

Make-ups for lecture exams will be available only for emergency situations that can be verified. If you miss a lecture exam due to illness or other emergency, make sure you or a friend contacts your instructor, Dr. Kurdziel by email at josephak@umich.edu and the Course Coordinator (Dr. Laura Eidielis, leidieli@umich.edu), within 24 hours of the exam. It is imperative that all students take their exams at the times listed in the syllabus; all exam dates were posted in LSA Course Guide well in advance of the beginning of the semester. There are no official alternate exams. Requests for make-up exams are handled on a case-by-case basis. To preserve the academic integrity of the course, the instructor reserves the right to alter the content and/or

format of the original test in creating a make-up exam. Students taking makeup exams will be asked to show a photo ID prior to taking the test.

Late-Assignment Policy:

GSI/UTAs will **deduct 25% of points per class period** for any late assignments.

Student Conduct Policy:

This syllabus is a contract between you, the instructor, and your GSI or UTA. Please read it carefully and refer to it throughout the semester. If you don't understand parts of this syllabus, you should speak with Dr. Kurdziel early in the semester.

We expect all students to respect each other's opinions. Everyone in this class should feel comfortable to express an idea, even if the idea is not a popular one. We encourage intellectual controversy and believe it is how we learn best. We expect all students to abide by the College of LSA's code of academic integrity (www.lsa.umich.edu/academicintegrity). Breaches of the student code such as cheating and plagiarism (that is, taking credit for the work of others) *will not* be tolerated and any breaches of the student code will be referred to the Dean's Office.

Official Withdrawal (W):

The official deadline for withdrawal from the course is **March 16, 2012** By the tenth week of class, about 50 % of your course assignments will have been completed, giving you a good indication of your projected final grade. If you decide that you cannot complete the course, make sure you officially withdraw; otherwise your final grade will be determined from the total number of points accumulated during your tenure in the class.

Incomplete (I):

An incomplete (I) grade will *only* be given when a student has missed $\leq 20\%$ of the course material for a reason that is acceptable to the instructors and has informed us in a timely manner. In addition, you must have earned grades equivalent to a "C" or better to be eligible for an incomplete at the time of your request.

Posting of Grades:

You will be able to view your course grades through *CTools* by clicking on the GradeBook 2 (=GB2) link. All graded material (exams and essays) will be returned promptly during your scheduled discussion sections. If you find there was a clerical error in posting a score to GB2, contact your GSI/UTA as soon as you notice the error. Discussion attendance and participation points will be posted at the end of each week and exam scores will be posted about 1.5 weeks after the exam date. Grades for writing assignments will be posted to GB2 generally within 2 weeks after the due date.

Re-grading Policy:

If you have a question about a *multiple-choice question* on an exam, bring this to Dr. Kurdziel's attention during office hours. If you have questions about grading on the two *writing assignments* or the *short answer sections on any exam*, you should first review the grading rubric for the assignment or the exam answer key posted by the instructor. If you still have questions, please discuss the issue with your GSI/UTA first. If you fail to resolve the issue with your GSI/UTA, you should contact the Course Coordinator. **You must bring unresolved re-grade issues to the attention of the Course Coordinator within two weeks of receiving the graded**

exam or essay. We *do not* consider such requests months after the exam or assignment was returned and the score posted on GB2, nor do we entertain them at the end of the semester.

Pass/Fail Option

If you are taking the course using the Pass/Fail option, you must earn at least a C- (minimum of 70%) to earn a passing grade (P) for the course.

Students with Disabilities

If you need or desire an accommodation for a disability, please contact your instructor and the Course Coordinator *before the third week of classes*. The earlier you make us aware of your needs, the more effectively we will be able to use the resources available to us. Students are encouraged to contact the Office of Services for Students with Disabilities (G219 Angell Hall; 763-3000), if they have not done so previously, for disability verification and to determine reasonable accommodations. We are committed to working with you to make appropriate arrangements and any information you provide will be treated as confidential.

Email policy

Unfortunately, we cannot answer detailed questions on lecture or exam material over email. Questions of this nature are best answered in person during the instructor's office hours or in person with any of the GSIs/UTAs (remember that you can attend the office hours of any of the GSIs teaching in the course). We try to arrange office hours such that we have someone with open hours at least every weekday.

SUCCESS IN BIOLOGY 171:

Tips on studying for the four exams

Each of the lecture exams will consist of 30 (or more) multiple choice questions and several short answer (4 to 5) questions. The questions are designed to test your knowledge of the ideas and concepts presented in the course. The principal source for the questions is the material presented in lectures, but questions will also come from material presented in the discussion activities.

Approximately 1/3 of the questions will be fairly straightforward and test your recall of definitions, concepts, and relationships. About 1/3 will be more challenging questions that probe your understanding of concepts at a deeper level and the last 1/3 of the questions will be "application" questions, where you will need to apply the concepts from the course to new situations. No amount of memorization can truly prepare you for these "application" questions. We will help you prepare for all question types by using sample questions during lecture and by posting practice questions prior to each exam (we post the previous year's exams prior to each exam date).

Here are some general suggestions for exam preparation

1. Come to every lecture and add your own notes to those provided on *CTools* (PDF files under "Resources" link) and on *LectureTools*. Most of the questions on the exam are derived from the material presented in the lecture. While the instructor puts key concepts and definitions on her prepared PowerPoint slides, she cannot fit the full explanation of each idea or concept on every slide. **You should definitely be writing down important points from the instructor's explanations into your notes.** You should also write down

any Qs that occur to you as you listen to the lecture and note areas where you are confused. Re-read the instructor's lecture notes and your own notes from each lecture at the end of the day. **Try to understand the factual information as well as the key concepts.** Re-write your notes and paraphrase the key concepts (try to put the material into your own words verbally). Lastly, explain the material to another student in the class. If you cannot paraphrase key ideas or concepts or *successfully* explain the material to a fellow student, then there are gaps or misunderstandings in your knowledge – be sure to fill in these gaps and straighten out any misunderstanding well before each exam date.

2. Review the interactive *LectureTools* Qs used in lecture – *don't memorize the correct answer* – but try to understand why that choice was the best answer. What was *wrong* with the other four choices offered? **Focus on understanding the concept and not simply memorizing material.** Try to determine whether the Q used was an application, synthesis, or evaluation type Q or a question that simply tests whether you comprehend the concept (knowledge or comprehension type Qs).
3. Review the material presented in your discussion section. Pay particular attention to material that overlaps with lecture topics.
4. Read the assigned pages in the textbook *before or after (or both)* you attend the lecture. Generally, the textbook goes into more detail than the lectures. This provides you with additional examples and background for the material presented in the course. Visit with your instructor (Dr. Kurdziel) and the GSIs/UTAs during their office hours to answer questions or resolve misunderstandings. Come prepared with a list of questions to best utilize office hours.

BIO 171: INTRODUCTORY BIOLOGY: ECOLOGY & EVOLUTION
Dr. Josephine Kurdziel Lecture Sections 001/002 & 003/004
WINTER 2012 SCHEDULE

Lectures meet in the Natural Sciences Auditorium. Discussion sections meet in various rooms across campus – please check your schedule.

The only required textbook is *Biological Science* by Scott Freeman; select readings for each lecture are provided for the 4th edition (2010).

Lecture #	Day & Date	Lecture Topic & Assigned Readings	Discussion Activity
1	Wednesday, January 4	Introduction to the Course and the Nature of Science Chapter 1 (1-12)	Week 1 = None <i>discussions start in week 2</i>
2	Friday, January 6	Biomes & What Determines Where Species are Found? Chapter 50 (993-1016)	
3	Monday, January 9	Population Growth & Population Regulation: Demography, Exponential & Logistic Growth Chapter 52 (1037-1046)	Week 2 = Population Dynamics
4	Wednesday, January 11	Behavioral Ecology 4 th edition: Chapter 51 (1019-1025, 1027-1030)	
5	Friday, January 13	Species Interactions I: Competition Chapter 53 (1058-1062)	
	Monday, January 16	MARTIN LUTHER KING HOLIDAY No lecture meeting	Week 3 = Reading Primary Literature Discussion sections meet on Tues/Wed (1/17, 1/18); NO DISCUSSION MON (1/16)
6	Wednesday, January 18	Species Interactions II: Predation & Herbivory Chapters 53 (1063-1066), 52 (1047-1050), 39 (778-781)	
7	Friday, January 20	Species Interactions III: Parasitism & Mutualism Chapters 53 (1066-1070), 28 (510-511), 31 (586-589), 38 (748-750)	
8	Monday, January 23	Food Webs, Trophic Cascades & Indirect Effects Chapters 53 (1070-1073), 54 (1083-1088)	Week 4 = Reading Primary Literature Discussion meets on MONDAY (1/23) ; <i>No Discussion sections on Tues/Wed (1/24, 1/25)</i>
9	Wednesday, January 25	In Class Exam Review	<i>Additional Review Session weekend before exam</i>
Exam 1	Wednesday, January 25 6 to 8 pm	COVERS LECTURES 1 THROUGH 8 Room assignments will be posted on CTools and announced in lecture	

Lecture #	Day & Date	Lecture Topic & Assigned Readings	Discussion Activity
10	Friday, January 27	Ecosystem Ecology: Food Webs, Energy Flow & Productivity Chapter 54 (1083-1092)	
11	Monday, January 30	Ecosystem Ecology: Cycling of Nutrients Chapter 54 (1092-1097)	Week 5 = Humans & Carbon
12	Wednesday, February 1	Climate Change Chapter 54 (1094-1102)	
13	Friday, February 3	Genetic Variation in Natural Populations: Key Role of Sex & Meiosis Chapters 11 (195-200), 12 (211-227); <i>know Table 12.2</i>	
14	Monday, February 6	Mendel & Simple Patterns of Inheritance Chapter 13 (230-239)	Week 6 = Energy Flows & Matter Cycles
15	Wednesday, February 8	Complex Patterns of Inheritance I Chapters 13 (239-244, 250-252)	
16	Friday, February 10	Complex Patterns of Inheritance II Chapters 13 (245-250), 12 (225-227)	Proposal Due
17	Monday, February 13	Population Genetics: Detecting Evolutionary Change & Hardy-Weinberg Model Chapter 25 (435-440)	Week 7 = Explaining & Predicting Genotype Frequencies
18	Wednesday, February 15	How Evolution Works: Darwinian View of Life NAS : Evolution & the Nature of Science Chapters 1 (4-5), 24 (414-432)	
19	Friday, February 17	Evolutionary Processes I: Natural Selection Chapter 25 (440-443)	
20	Monday, February 20	Evolutionary Processes II: Sexual Selection Chapter 25 (452-455)	Week 8 = Computer Simulations: Hardy-Weinberg Equilibrium & Deviations from HWE
21	Wednesday, February 22	In Class Exam Review	<i>Additional Review Session</i> weekend before exam
Exam 2	Wednesday, February 22 6 to 8 pm	COVERS LECTURES 10 THROUGH 20 Room assignments will be posted on CTools and announced in lecture	

Lecture #	Day & Date	Lecture Topic & Assigned Readings	Discussion Activity
22	Friday, February 24	Evolutionary Processes III: Genetic Drift, Mutation & Gene Flow Chapters 25 (443-450), 15 (279-287)	
Winter Break	February 25 through March 4	Winter Break – No Classes	Week 9 – No Discussions Winter Break
23	Monday, March 5	Synthesis of How Evolution Works & Evidence for Evolution NAS: Evidence for Evolution Chapter 24 (414-432)	Week 10 = Evolution & Speciation in Cichlids
24	Wednesday, March 7	Species and Speciation Chapter 26 (458-468)	
25	Friday, March 9	Phylogenetics and the Tree of Life Chapter 27 (474-479) & Bioskills 3; Baum <i>et al.</i> 2005	
26	Monday, March 12	Brief History of Life on Earth & Fossil Record Chapter 27 (479-492)	Week 11 = Frogs and Phylogeny
27	Wednesday, March 14	Archean: Archaea & Bacteria Chapter 28 (496-518)	
28	Friday, March 16	Viruses: Diversity & Evolution Chapter 35 (675-692)	
29	Monday, March 19	Proterozoic: Origins of Eukaryotes, Multicellularity & Protist Diversity Chapter 29 (519-543)	Week 12 = Influenza Evolution
30	Wednesday, March 21	Paleozoic I: Origin of Animals – Life in the Oceans Chapters 32 (601-609, 617-620), 33 (623-625), 34 (646-655)	
31	Friday, March 23	Paleozoic II: Colonization of Land: Plants & Fungi Chapter 30 (546-561)	
32	Monday, March 26	Fungi: Diversity & Evolution Chapter 31 (579-591)	Week 13 = Ant & Fungal Coevolution
33	Wednesday, March 28	In Class Exam Review	<i>Additional Review Session</i> weekend before exam
Exam 3	Wednesday, March 28 6 to 8 pm	COVERS LECTURES 22 THROUGH 32 Room assignments will be posted on CTools and announced in lecture	

Lecture #	Day & Date	Lecture Topic & Assigned Readings	Discussion Activity
34	Friday, March 30	Mesozoic and Early Cenozoic: Terrestrial Diversification – Insects & Angiosperms Chapters 30 (561-565), 40 (892-895, 788-790, 792-798)	
35	Monday, April 2	Highlights of Vertebrate Evolution Chapter 34 (646-668)	Week 14 = Essay Writing Workshop
36	Wednesday, April 4	Mammals & Human Evolution Wade 2007 article Chapter 34 (660, 665-666, 668-673)	
37	Friday, April 6	Contemporary Communities: Structure and Patterns Chapters 53 (1070-1072), 55 (1117-1120)	Essay Due
38	Monday, April 9	Communities & Structure II Chapter 53 (1070-1071, 1073-1077, 1078-1080)	Week 15 = Selection in Human Populations
39	Wednesday, April 11	Species Invasions Chapters 50 (1013-1017), 55 (1111-1114)	
40	Friday, April 13	Emerging Diseases Cohen 2000 article (<i>optional</i>) Chapter 35 (688-690)	
41	Monday, April 16	Conserving Earth's Biodiversity Chapters 53 (1077-1078), 55 (1105-1123)	Week 16 = None Classes end this week
Exam 4	Tuesday, April 24, 7 to 9 pm	Covers lectures 34 through 41 Room assignments will be posted on CTools and announced at last lecture Note Time: Scheduled by LSA	<i>Additional Review Session</i> weekend before final; date & location will be announced in lecture once room is confirmed