Biology 150: Organismal and Ecological Biology
University of Tennessee, Spring 2016
Tuesday and Thursday, 12:40 – 1:35 pm, Sections 10 – 18, Alumni Memorial Building 32

Instructor: Benjamin P. Keck, PhD
bkeck@utk.edu
443 Hesler Biology Building
974-2821

Office hours: 2:00 – 3:00 pm Tuesday, Wednesday, and Thursday, or by appointment. It’s best to start with an email with a few day/times you would be able to meet, and I will respond as quickly as I can. When you email, put Bio 150 in the subject line and provide me with enough information to answer any questions. I highly encourage students to make appointments or stop by during office hours, individually or in small groups.

Teaching Assistants: Cassie Dresser cdresser@vols.utk.edu Office hrs M 10–11 AM or by appt.
Hailee Korotkin hkorotki@vols.utk.edu Office hrs by appointment
Leigh Moorhead lmoorhea@vols.utk.edu Office hrs by appointment

Course website: You will find the Biology 150 web page on the Blackboard Course Management System at https://blackboard.utk.edu/webapps/login/. If you don’t know how to use this resource, tutorials are available at http://online.utk.edu/. I recommend that you check Blackboard frequently for new announcements, schedule changes, and assignments. You will have one, merged course site: Bio 150: Keck TR

Course description: Intended for science majors, an introduction to the major biological concepts emphasizing the organismal and ecological aspects of life. Organized along themes of evolution, structure and function, information flow, exchange and storage, pathways of energy and matter, and systems.

Goals of this course: This course is organized to meet the goals of the General Education Natural Sciences requirement. Reaching these goals will help you interpret and interact with the world around you, as well as prepare you for subsequent courses in the biological sciences.

“As science and technology come to play an increasingly important role in contemporary life, it is essential for all educated persons to have a fundamental understanding of science and its methods. All students should be familiar with one or more scientific disciplines and the role of science in contemporary society. Such familiarity may be gained through acquisition of knowledge of a discipline's basic vocabulary, chief discoveries, and fundamental principles; exposure to a discipline's experimental techniques; and the ability to analyze issues with scientific dimensions.”

By the end of this course, you should be able to explain how the five big ideas (FBIs) in biology relate to the development, maintenance, and loss of biodiversity on the planet

1. Evolution: Populations of organisms and their cellular components have changed over time through both selective and non-selective evolutionary processes.
2. Structure and Function: All living systems (organisms, ecosystems, etc.) are made of structural components whose arrangement determines the function of the systems.
3. Information Flow and Storage: Information (DNA, for example) and signals are used and exchanged within and among organisms to direct their functioning.
5. Systems: Living systems are interconnected, and interact and influence each other on multiple levels.

You should also demonstrate the following five scientific practices (FSPs):
1. Link lecture topics and synthesize information, particularly in reference to the FBIs
2. Develop hypotheses and predictions (ask scientific questions) based on models or data
3. Interpret scientific representations, such as graphs, phylogenies, or molecular structures, or data, and come to a conclusion (with evidence)
4. Summarize information from scientific articles or other sources
5. Predict the consequences of changes to systems or pathways
How you will learn the material
You need to think for learning to occur, and not just in class. Before class you should complete any assigned reading, videos, or MasteringBiology; these will provide the background information for what we do during lecture. Lecture time is divided between putting information into context and synthesizing the information through discussion and activities. There will be several group learning exercises during the term. If you miss these days you will need a valid excuse to complete make-up assignments. Everyone in the group receives the same grade. These will be discussion-based, problem solving exercises. After class, you should review the learning objectives and make sure you can link concepts from multiple classes together. Exams will test your understanding of the concepts, not just your ability to memorize information.

Required Books:


The UT bookstore has several versions of this text available, I’ll go over these in the first lecture.

*MasteringBiology Access:* You will need access to MasteringBiology to complete online assignments. Access comes with the purchase of a new book or with an e-text through the Pearson website. To access the page for this course on the Pearson website, follow the instructions on the pdf on Blackboard, or search for the text on the Pearson website and then for the section ID: KECKBIO150S2016

Readings and Videos: There will be several articles and links to videos available on the class Blackboard site that will be required for specific lectures. These will be announced in class and on Blackboard.

Grading: I will use the standard UT grading scale without minuses. I will adjust the final grades by discussion section. There will be no extra credit for individuals. Any excuse or concern for absence or tardy work should be discussed with me within one week. Make up exams may be entirely different and adjusted to account for extra study time. There is a total of 1000 points available during the course: 750 in Lecture and 250 in Lab.

<table>
<thead>
<tr>
<th>Clicker Points:</th>
<th>50</th>
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<tbody>
<tr>
<td>In Class Group Activities:</td>
<td>200</td>
</tr>
<tr>
<td>MasteringBiology:</td>
<td>50</td>
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<tr>
<td>Lecture Exam 1:</td>
<td>80</td>
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<tr>
<td>Lecture Exam 2:</td>
<td>110</td>
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<td>Lecture Exam 3:</td>
<td>110</td>
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<td>Lecture Final:</td>
<td>150</td>
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<tr>
<td>Lab Grades:</td>
<td>250</td>
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<tr>
<td><strong>Total:</strong></td>
<td><strong>1000</strong></td>
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**Grading Scale by percentage of 1000 points**

- 90 – 100 = A
- 87 – 89 = B+
- 80 – 86 = B
- 77 – 79 = C+
- 70 – 76 = C
- 67 – 69 = D+
- 60 – 66 = D
- ≤ 59 = F

Tests: There are four exams, worth a total of 450 points. I will provide study guides/lists of definitions and ideas you should know for each exam. We will use Immediate Feedback (IF) testing for a portion (usually 20 points) of each exam. IF testing involves groups of 4-5 students working together to answer a set of questions. I’ll go over this in more detail before the first exam.

Clickers: During lectures I will ask questions that you will answer with a Turning Point Technologies device (a clicker), or a mobile device with the Turning Point Technologies app. Instructions for registering and using your “clicker” are found in the Course Syllabus area of the lecture Blackboard site. **My clicker channel is 61.** There will be more than 70 points available during the term, but a maximum of 50 points will be applied to your grade. These extra points are added to cover a missed lecture or forgotten clicker. Anyone caught using multiple clickers will lose ALL of their clicker points as will the owners of the other clickers.

Technology: You may only use electronic devices in class for topical applications, only when I say to use them. Off topic use of these devices is not permitted and will result in that device living next to the podium for the remainder of class. **During exams and quizzes, any electronic device seen on your desk or within sight will result in a grade of zero.**
Schedule (subject to change): 22 January – last day to drop without “W”, 5 April – last day to drop with “W”. Readings from the textbook are listed next to the lecture topic, and you should read before lecture. There may also be readings, videos, or podcasts assigned; these will be mentioned in a preceding lecture.

Week 1: 14 January
Lecture 1: Introduction
BioLit Session: No meetings

Week 2: 19 and 21 January
Lecture 2: Scientific method: Data, correlations, and hypothesis testing Ch. 1.5, Vaccine on Blackboard
Lecture 3: Genetics: Genes, individuals, recombination, and reproduction Ch. 13.2, 13.4, 15.5, 16.2, 26.6
BioLit Session: Module 1 – Intro and hypothesis testing

Week 3: 26 and 28 January
Lecture 4: Genetics: Populations Ch. 26.1, 26.2, 26.3
Lecture 5: Genetics: Species Ch. 27.1 and Species on Blackboard
BioLit Session: Module 1 (Experimental design and data interpretation) – Fecal transplants

Week 4: 2 and 4 February
Exam 1
Lecture 6: Evolution: Phylogenetics Ch. 28.1, 28.2 and Matzke on Blackboard
BioLit Session: Module 1 – Wolf Spiders

Week 5: 9 and 11 February
Lecture 7: Evolution: Drift and Natural Selection Ch. 25, 26.3 to page 475, 26.4
Lecture 8: Evolution: Sexual Selection and Reproductive isolating barriers Ch. 26.3, RIB on Blackboard
BioLit Session: Module 1 – Induced plant defenses

Week 6: 16 and 18 February
Lecture 9: Evolution: Hybridization and novel phenotypes Ch. 26.5, 27.4
Lecture 10: Evolution: Dispersal and Vicariance Ch. 27.2, 27.3
BioLit Session: Module 1 – Quiz

Week 7: 23 and 25 February
Lecture 11: Evolution: Biogeography Article or video
Lecture 12: Evolution: Evolutionary novelty and patterns through the Tree of Life Ch. 28.3 and article
BioLit Session: Module 2 (Synthesizing data and using models) – Ant bodyguards and pollinators

Week 8: 1 and 3 March
Exam 2
Lecture 13: Ecology: Populations Ch. 52, 54
BioLit Session: Module 2 – Recreational fishing and trophic cascades

Week 9: 8 and 10 March
Lecture 14: Ecology: Communities Ch. 55
Lecture 15: Ecology: Guest or video with assignment
BioLit Session: Module 2 – Recreational fishing and trophic cascades

Week 10: 15 and 17 March
SPRING BREAK!!!!!!!!!

Week 11: 22 and 24 March
Lecture 16: Ecology: Dispersal – islands and invasions Article or video
Lecture 17: Ecology: Ecosystems Ch. 56
BioLit Session: Module 2 - Quiz
Week 12: 29 and 31 March
Exam 3
BioLit Session: Module 3 (Synthesizing multiple scientific papers) – Activity

Week 13: 5 and 7 April
Lecture 19: Biodiversity: Origins of Life review Ch. 6 and read ChemEvolution on Blackboard
Lecture 20: Biodiversity: Bacteria and Archaea Ch. 29
BioLit Session: Module 3 (Synthesizing multiple scientific papers) – Activity

Week 14: 12 and 14 April
Lecture 21: Biodiversity: Protists Ch. 30
Lecture 22: Biodiversity: Plants and Fungi Ch. 31, 32
BioLit Session: Module 3 (Synthesizing multiple scientific papers)

Week 15: 19 and 21 April
Lecture 23: Biodiversity: Invertebrates to Fishes Ch. 33, 34, 35 to p 695
Lecture 24: Biodiversity: Fishes to Amphibians, Reptiles, Dinosaurs, and Avians Ch. 35.3 finish
BioLit Session: Module 3 (Synthesizing multiple scientific papers) – Presentation of final projects

Week 16: 26 and 28 April
Lecture 25: Biodiversity: Mammals and Hominids Ch. 35.4 and articles
Lecture 26: Biodiversity: The Anthropocene: loss of biodiversity Ch. 57 and Elephants on Blackboard
BioLit Session: No meetings

Final Exam
Wednesday the 4th of May at 10:15 AM, normal classroom.

Academic integrity:
Academic dishonesty of any sort will not be tolerated. Plagiarism includes the copying of answers, phrases, portions of sentences or the main ideas from ANYONE on ANY work submitted for a grade (exams, assignments, quizzes, etc).

You are expected to abide by The University of Tennessee honor statement in Biology and in all of your university activities as pledged in the honor code:

“An essential feature of the University of Tennessee, Knoxville, is a commitment to maintaining an atmosphere of intellectual integrity and academic honesty. As a student of the University, I pledge that I will neither knowingly give nor receive any inappropriate assistance in academic work, thus affirming my own personal commitment to honor and integrity.”

Depending on the offence, penalties for academic dishonesty range from a minimum of a zero for the assignment, to an F for the course, to the filing of formal academic dishonesty charges seeking dismissal from The University of Tennessee. These choices are at the discretion of the instructor, and can occur in either the lecture or the lab portion of the class. You should be familiar with the requisites of academic honesty and what constitutes academic dishonesty as outlined in the UT Undergraduate Catalog (http://catalog.utk.edu/).
Other information

Disability Services: If you need course adaptations or accommodations because of a documented disability, please contact me privately to discuss your needs. If you have questions or concerns about disabilities or emergency information to share, please contact Disability Services: 2227 Dunford Hall; 974-6807 or 865-622-6566 for video phone; Email: ods@utk.edu; Website: http://ods.utk.edu/).

Tutoring: The Division of Biology does not offer tutoring services. Contact the Student Success Center and the Academic Support Unit of The Office of Minority Student Affairs for information about tutoring opportunities.

Student Success Center: The comprehensive source for information, services, and resources to assist your success at UT: http://studentsuccess.utk.edu

Student Success Center:
812 Volunteer Boulevard, Greve Hall, room 324, 865 974-6641, Email: studentsuccess@utk.edu

Technical Assistance:
Blackboard, clickers, or general information technology assistance:
• Help Desk: 865 974 9900 (M – F, 8:00 – 5:00)
• OIT Walk-In Help Desk: Commons, 2nd floor Hodges Library
• Turning Technologies (clickers): 866 746 3015

Counseling Center: http://counselingcenter.utk.edu/
900 Volunteer Boulevard, 865 974-2196, Email: counselingcenter@utk.edu

OTHER RESOURCES FOR STUDENTS:
• One Stop: http://onestop.utk.edu (start here for any question you have)
• Undergraduate Catalogs: http://catalog.utk.edu (Listing of academic programs, courses, and policies)
• Hilltopics: http://dos.utk.edu/hilltopics (Campus and academic policies, procedures and standards of conduct)
• Course Timetable: https://bannerssb.utk.edu/kbanpr/bwckschd.p_disp_dyn_sched (Schedule of classes)
• Academic Planning: http://www.utk.edu/advising (Advising, course requirements, and major guides)
• Library: http://www.lib.utk.edu (Access to library resources, databases, course reserves, and services)
• Career Services: http://career.utk.edu (Career counseling and resources; HIRE-A-VOL job search system)