Biology 101: Cells, Genetics, and Physiology  
University of Tennessee, Fall 2015  
Tuesday and Thursday, 8:10 – 9:25 am, Sections 53-62, Science and Engineering, RM 307

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

Office hours: 4:00-5:00 pm Tuesday, 2:00-3:00 Wednesday, or by appointment. It’s best to start with an email with a few days/times you would be able to meet, and I will respond as quickly as I can. When you email, put Bio101 in the subject line and provide me with enough information to answer any questions.

Course website: You will find the Biology 101 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: Bio101 TR 8:10 Keck Lecture.

Course description: For non-biology majors, introduction to the principles of biology as they relate to cellular and organismal level processes. Topics include cell structure and major fundamental metabolic processes such as energy flow in biological systems, protein synthesis and aspects of genetics. Includes a survey of human anatomy and physiology with topics relating to human health.

Biology Degree Learning Objectives:  
This course is organized to meet the goals of the General Education Natural Sciences requirement:

“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.”

You should be able to explain the five big ideas (FBIs) in biology as they relate to topics you have learned throughout your degree program

1. **Evolution**: Populations of organisms and their cellular components have changed through time by both selective and non-selective 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.
4. **Transformations of Energy and Matter**: All living things acquire, use, and release matter and energy for cellular / organismal functioning.
5. **Systems**: Living systems are interconnected, and interact on multiple levels.

You should also be proficient in the following scientific practices:

- Formulate empirically-testable hypotheses
- Interpret visual representations of data (figures and diagrams)
- Evaluate data and come to a conclusion based on evidence (formulate an argument)
Required Books:


*Lab Manual:* Biology 101 laboratory manual, 7th ed. by Brewton and Guffey *must be purchased new*

*LaunchPad Access:* If you purchase a new or electronic version of the textbook it will be packaged with a LaunchPad Access Kit (the kit contains a code that will allow you access to the website). If your book is used, you may purchase access to the online site by going to the website [http://www.macmillanhighered.com/Catalog/Product.aspx?isbn=1464161461](http://www.macmillanhighered.com/Catalog/Product.aspx?isbn=1464161461). There is a pdf with information on the LaunchPad website for this course under Course Materials in Blackboard. Do not wait to ask for help with this! Homework assigned through Mastering Biology is worth 60 points.

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 lab section. There will be no extra credit. Any excuse or concern for absence or tardy work should be discussed in a timely manner. There is a total of 800 points available during the course: 600 in Lecture and 200 in Lab.

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<tr>
<th>Clicker Points:</th>
<th>80</th>
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<tr>
<td>In Class Group Questions:</td>
<td>60</td>
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<td>LaunchPad:</td>
<td>60</td>
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<tr>
<td>Lecture Exam 1:</td>
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<td>Lecture Exam 2:</td>
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<td>Lecture Exam 3:</td>
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<td>Lecture Final:</td>
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<td>Lab Grades:</td>
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<td><strong>Total:</strong></td>
<td><strong>800</strong></td>
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**Grading Scale by percentage of 800 points**

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<th>Percentage</th>
<th>Grade</th>
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<td>90 – 100</td>
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<td>87 – 89</td>
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<td>80 – 86</td>
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<td>60 – 66</td>
<td>D</td>
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<td>≤ 59</td>
<td>F</td>
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Tests: There are four exams, each worth 100 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 100 points available during the term, but a maximum of 80 points will be applied to your grade. These extra points are added to cover a missed lecture or forgotten clicker. Questions will cover material from previous lectures, the current lecture, and any readings assigned for that lecture.

In Class Group Questions: There will be two group learning exercises during the term worth 30 points each; dates below. If you miss these days you will need a valid excuse to complete a make-up assignment. Everyone in the group receives the same grade. These will be discussion-based, problem solving exercises and the products may find their way onto an exam as a question.

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. Anyone caught using multiple clickers will lose ALL of their clicker points as will the owners of the other clickers, plus they will be confiscated and must be picked up in my office. 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):

Week 1: 20 August
Lecture 1: Introduction

Week 2: 25 and 27 August
Lecture 3: Ch. 2. The Chemistry of Life. The Blue Marble. Water Scarcity

Week 3: 1 and 3 September
Lecture 4: Ch. 2. Molecules of Life. Color: Pigments and Structure
Lecture 5: Ch. 3. Cell Types, Structures, and Function

Week 4: 8 and 10 September
Lecture 6: Ch. 5. Photosynthesis: Economics
Lecture 7: Ch. 6. Cellular Respiration and Energy

Week 5: 15 and 17 September
Lecture 8: Ch. 4. Nutrition and Metabolism: Humans and other animals. Review
Exam 1

Week 6: 22 and 24 September
Lecture 9: Ch. 25. Homeostasis and Physiology
Lecture 10: Ch. 26 & 27. Digestive and Cardiovascular Systems

Week 7: 29 September and 1 October
Lecture 11: Ch. 28. Respiration on Land, in the Water, and with Pollution
Lecture 12: Ch. 29. Neural Networks and Muscles. ALS and causes of CNS disorders

Week 8: 6 and 8 October
Lecture 13: Ch. 31. Immune System and Environmental Allergies
Lecture 14: Group Activity 1

Week 9: 13 and 15 October
Exam 2
FALL BREAK

Week 10: 20 and 22 October
Lecture 15: Ch. 30. Reproduction: Behavior and Human Reproductive Health
Lecture 16: Ch. 7. DNA

Week 11: 27 and 29 October
Lecture 17: Ch. 8. RNA and Proteins
Lecture 18: Ch. 9 & 10. Origins of Genetic Variation: Mutation and Cancer

Week 12: 3 and 5 November
Lecture 19: Ch. 11 & 12. Patterns of Inheritance
Lecture 20: Review. Group Activity 2

Week 13: 10 and 12 November
Exam 3
Lecture 21: Guest Lecture

Week 14: 17 and 19 November
Lecture 22: Genomics and Genetic Manipulation for Food and Health 1
Lecture 23: Genomics and Genetic Manipulation for Food and Health 2
Week 15: 24 and 26 November
Lecture 24: Ch. 12. Genetic Patterns and Inferring Causes

Thanksgiving

Week 16: 1 December
Lecture 25: Zombies, Ebola, Plague, and other things that go bump in the night

Final Exam
Thursday, 10\textsuperscript{th} Dec., 8:00 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:

\begin{quote}
\textit{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 inappropiate assistance in academic work, thus affirming my own personal commitment to honor and integrity.}
\end{quote}

(2014-2015 Undergraduate Catalog)

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 (\url{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: 100 Dunford Hall; 974-6807 or 865-622-6566 for video phone; Email: ods@utk.edu; Website: \url{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.

\begin{itemize}
\item **Student Success Center:** The comprehensive source for information, services, and resources to assist your success at UT: \url{http://studentsuccess.utk.edu}
  \begin{itemize}
  \item 812 Volunteer Boulevard, Greve Hall, room 324, 865 974-6641, Email: studentsuccess@utk.edu
  \end{itemize}
\end{itemize}

Technical Assistance:
Blackboard, clickers, or general information technology assistance:

\begin{itemize}
\item Help Desk: 865 974 9900 (M – F, 8:00 – 5:00)
\item OIT Walk-In Help Desk: Commons, 2\textsuperscript{nd} floor Hodges Library
\item Turning Technologies (clickers): 866 746 3015
\end{itemize}

Counseling Center: \url{http://counselingcenter.utk.edu/}
1800 Volunteer Boulevard, 865 974-2196, Email: counselingcenter@utk.edu