

Biology 160: Organization and Function of the Cell
3 credits lecture and discussion
The University of Tennessee, Fall2017

Lecture: Tuesday and Thursday **11.15 am-12.05 pm**, AMB 32

Lecture Instructors: Dr. Gladys Alexandre (galexan2@utk.edu)
Office Hours (F425 Walters Life Sciences): Monday 11-12pm; Tuesday 1-2pm
Other meetings by appointment; Mondays and Tuesdays preferred

Teaching assistants:

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Lecture exams: All exams will be proctored on AMB 32 at the dates indicated in the schedule.

Course Description: Intended for science majors. An introduction to the major biological concepts emphasizing the cellular and molecular aspects of life. Organized along themes of evolution, structure and function, information flow, exchange and storage, pathways of energy and matter, and systems. ***Satisfies General Education Requirement: (NS)***

What you should learn in this course

By the end of the course, you should be able to explain how scientists define and study cells, as well as how ***five fundamental concepts*** listed below unify biology relate:

- **Evolution:** Populations of organisms and cells, including their molecular components, have changed over time through both selective and non-selective evolutionary processes.
- **Structure and Function:** All living systems (cells, organisms, ecosystems, etc.) are made of structural components whose arrangement determines the function of the systems.
- **Information Flow and Storage:** Information (DNA, for example) and signals are used and exchanged within and among cells and organisms to direct their functioning.
- **Transformations of Energy and Matter:** All living things acquire, use, and release and cycle matter and energy for cellular / organismal functioning.
- **Systems:** Living systems are interconnected, and they interact and influence each other on multiple levels.



You should also be proficient in the following **five scientific practices (FSPs)**:

- Formulate empirically-testable hypotheses; ask scientific / critical questions
- Synthesize information and identify patterns (from readings or data)
- Interpret visual representations (figures and diagrams)
- Evaluate data and come to a conclusion (with evidence) (formulate an argument)
- Communicate information in writing

How you will learn the material

You need to THINK for learning to occur. I provide pre-class readings, videos and quizzes so you can think about the basic concepts before class. Class is to apply ideas, clarify your understanding and test your learning. Learning results from being actively engaged with the material, repeatedly and in many forms. You are expected to come to class prepared by having read the sections assigned for the lecture and by having completed any pre-class assignment. Being prepared for lecture is essential to succeed in the course. The lectures will be constructed assuming you will be responsible enough to prepare as indicated. The instructor will generally not

lecture on descriptive content clearly explained in the book, unless specific questions are relayed to the instructor PRIOR to the class meeting. You will be expected to participate in class discussions and activities and to complete assignments and homework on time. These activities are implemented to help you learn and master the concepts. MasteringBiology includes study modules that can also help you learn. The information will be presented in an organized fashion to facilitate learning and will thrive to focus on the most challenging concepts. In addition, the instructors will provide you with activities and assignments to facilitate your engagement with the material as well as to test your understanding, **but you will have to devote time outside of lecture to synthesize and link the concepts together.** Quizzes and tests will test your understanding of the concepts, NOT just your ability to memorize information.

Lecture Schedule **This schedule is tentative and subject to change!** <i>Sept 1- Last day to drop without a "W"; Nov 14- Last Day to Drop with a "W"(WP/WF); Dec 5- Last Day for a University Withdrawal</i>	Reading assignments (Readings must be completed PRIOR to lecture; other readings may be assigned)/ Pre-class quiz topic
August 24 Class Introduction, Cell theory	Chapter 1.2
August 29 Water and Carbon: the chemical basis for life	Chapter 2 / table 2.3 p. 74-75
August 31 Biological Macromolecules / Proteins	Chapter 3/ Fig. 3.10 and 3.11
September 5 Biological Macromolecules / Nucleic acids	Chapter 4/Fig. 4.3-4.5, Table 4.1
September 7 Biological Macromolecules / Carbohydrates	Chapter 5 / Table 5.1
September 12 Biological Macromolecules/Lipids and membranes	Chapter 6.1-6.2/ Fig. 6.4-6.8
September 14 Transport of Proteins in the cell	Chapter 6.3-6.4/Fig. 6.14–6.17
September 19 EXAM 1 (all material covered including chapter 7)	
September 21 Introduction to energy transformation in a cell	Chapter 8.1-8.2/ Fig. 8.6 - 8.9
September 26 Enzymes and Metabolism	Chapter 8.3-8.5/Fig. 8.11-8.12
September 28 Harvesting chemical energy: respiration	Chapter 9.1-9.3/ Fig. 9.2-9.3
October 3 Harvesting chemical energy: respiration and fermentation	Chapter 9.4-9.6/ Fig. 9.10-9.15
October 5 FALL BREAK- NO CLASS	
October 10 Photosynthesis	Chapter 10.1-10.2/Fig.10.9-10.10
October 12 Photosynthesis	Chapter 10.3-10.4/Fig. 10.16
October 17 EXAM 2 (all material covered since exam 1)	
October 19 Cell cycle and cell division: organization of the chromosome	Chapter 12.1-12.2/Fig. 12.4
October 24 Cell cycle and mitosis	Chapter 12.3-12.4/ Fig. 12.12
October 26 Meiosis	Chapter 13 /Table 13.1
October 31 DNA replication: synthesis and repair	Chapter 15.1-15.3/ Fig. 15.8
November 2 DNA replication: synthesis and repair	Chapter 15.4-15.5/Fig. 15.12
November 7 How genes work	Chapter 16/ Fig. 16.6
November 9 <i>Case Study as a test for previous material</i> 	<i>In class graded assignment</i>
November 14 DNA to proteins: transcription	Chapter 17.1-17.2/ Fig. 17.1
November 16 DNA to proteins: translation	Chapter 17.3-17.5/ Fig. 17.13
November 21 Control of gene expression (Bacteria)	Chapter 18.1-18.3/Fig.18.1- 18.5
November 23 Thanksgiving Break- NO CLASS	
November 28 Control of gene expression (Bacteria)/ <i>Case study</i> 	Chapter 18.4-18.5/ Fig. 18.10/ <i>In-class graded assignment</i>
November 30 Control of gene expression (Eukaryotes)	Chapter 19/Fig. 19.1-19.10
December 5 Final Review	

Final Exam Friday December 8 10.15 - 12:15 p.m. As per the registrar's website: "Final exams must be given during the final exam period at the scheduled time, although alternative uses of the scheduled exam period may be designated by the instructor. Students are not required to take more than two written exams on any day. The instructor(s) of the last non-departmental exam(s) on that day must reschedule the student's exam during the exam period. **It is the obligation of students with such conflicts to make appropriate arrangements with the instructor at least two weeks prior to the end of classes.**"

Important dates to remember and to mark in your calendars

Technology: While in class, keep all electronic devices (especially smartphones) out of sight. The use of laptops in class will be discussed the first week of class. **During exams and quizzes, any electronic device seen on your desk or within sight will result in a grade of zero.**

Support for learning

Texts and Materials:

- REQUIRED Text: Freeman, et al. Biological Science (6th ed). Pearson Publishing. This book is available at the bookstore. You can also purchase it as an e-Book from Pearson Publishing directly (www.masteringbiology.com). The library also has a limited number of copies on reserve.
- REQUIRED Mastering Biology software: free with purchase of a new textbook at bookstore; you can also purchase the software directly from Pearson as either Mastering with or without the e-Book. The Mastering Biology Course site is **MBALEXANDRE41975**
- REQUIRED Learning Catalytics access: can be purchased from Mastering Biology Home page.

Course website: <http://online.utk.edu/> (Click "Login to Online@UT" to get to Canvas). The Canvas lecture site will be used regularly for communication and posting lecture syllabus, PowerPoint slides, Pre-class quizzes, assignments, course grades, etc.

Communications:

- You need to regularly check your UTK e-mail account for weekly announcements related to this course. If you are not receiving those e-mails, there is something wrong with your account! If this is the case, OIT will be able to help you.
- If you need to meet and can't make office hours, please use your UTK e-mail (spam filters may exclude other addresses) to schedule a meeting. Keep in mind that once I leave my office at the end of the day, I may not check my e-mail until the following workday, or the first day back after a weekend.

Study Rooms:

417 Hesler is a quiet study room for majors in Biology. It can also be reserved for group study. Strong Hall room 102 is a student resource center (printing, etc.).

Assessment of your learning

Assessment (quizzes, exams, assignments) is very important to the learning process. It lets you and me know what you understand and what you do not. I will quiz often because it encourages you to keep up with your studying and helps you learn – every time you have to re-process information you learn more! It also gives me an important feedback mechanism to know what parts of the syllabus are more challenging.

Although much of the assessment in this course will be multiple choices, we will also use short answers and may use written assignments to deepen your understanding.

Lecture: (75% of grade; 750 points)	
Exams 1 and 2 (100 pts each; multiple choices and short answers)	200 points
Case studies (2 at 50 pts each)	100 points
Final exam = Exam 3 (with cumulative part representing 25% of total)	150 points
Quizzes and Assignments (approximate break-down below)	
In-class/Pre-class quizzes and in-class group activities -	20% or 150 points
Mastering biology assignments	20% or 150 points
Total (lecture)	750 points
	+
BioLit: (25% of grade; 250 points) – See BioLit syllabus	250 points
Total BIOL160	1000 points

Exams / Quiz / Assignment Policies:

- NO make-up quizzes, in-class activities, clicker points, in-class or mastering biology assignments will be given; there will be “extra” quiz points built into the course to allow for missing classes, forgetting your clicker, etc.
- The quizzes may or not be announced and will be delivered in-class or prior to class via Learning Catalytics. The quizzes may pertain to assigned readings prior to the day lecture or from a past lecture.
- The quizzes and assignments (Masteringbiology, Learning Catalytics or Canvas quizzes) MUST be taken and are NOT optional.
- The 2 lowest masteringbiology assignments and the 4 lowest Learning catalytics/Canvas quiz scores will be dropped. Dropping the lowest score is intended to cover any problem such as forgetting to bring the clicker in class, clicker malfunction, having computer or internet access issues, missing class etc.
- NO make-up exams will be given without a valid excuse (e.g., family emergency, medical emergency, etc). The excuse MUST be documented.
- **VERY IMPORTANT:** If you are going to miss an exam, you MUST contact me prior to the start of the exam. Send me an e-mail, and if you don’t receive an acknowledgment of your email, send it again
- Make-up exams may be short answers, fill-in-the-blanks, or essay and will be scheduled at the instructor’s convenience and by my permission only.
- Assignments turned in after the due date will lose 25% of the points per 24 hours after the deadline.
- All work should be done independently (unless group work is permitted, and then you may ONLY work within your group on the assignment); plagiarism software will be used to check written assignments for copying from classmates or other sources. **Plagiarism will result in stiff penalties – please see section below. **Using a classmates’ clicker to give them points is cheating!!**
- Exams will be prepared from all information sources: lecture, textbook, assigned reading outside of the textbook or handouts.
- Exam, quiz, assignments and activity scores will be posted on our class Canvas site (online@UT)
- **Be aware that no individual credit will be available for this class outside of what the instructor may offer for the entire class, i.e., no extra credit may be offered to a single student or a group of students if it is not also offered to the entire class.**

Final letter grades will be determined by the total percentage of 1,000 points accumulated as follows:

A	93 – 100%	C	73 – 76%
A-	90 – 92%	C-	70 – 72%
B+	87 – 89%	D+	67 – 69%
B	83 – 86%	D	63 – 66%
B-	80 – 82%	D-	60 – 62%
C+	77 – 79%	F	<60%

Academic integrity:

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

You are expected to abide by The University of Tennessee honor statement in Biology 130 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.”

(2012-2013 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 (<http://catalog.utk.edu/>).

Other course information

Tennessee Education Lottery Scholarship Recipients: All courses for which you are enrolled count toward your attempted hour total. You must receive approval from the Office of Financial Aid & Scholarships when withdrawing from UT or changing your enrollment status from full-time to part time in order to maintain good standing for the TELS program. Approvals are only issued for extraordinary circumstances, such as the death of an immediate family member, documented serious illness, or military mobilization. See Financial Aid website at: <http://web.utk.edu/~finaid>

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; Email: ods@utk.edu; Website: <http://ods.utk.edu/>.

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

Academic Assistance:

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.tennessee.edu/studentsuccesscenter/>
 - 1817 Melrose Avenue, and 812 Volunteer Boulevard, 865 974-6641, Email: studentsuccess@utk.edu
- **Academic Support Unit of The Office of Minority Student Affairs** offers some tutoring services available to all students, but openings are limited and are filled quickly. The office offers other types academic assistance and support as well: <http://omsa.utk.edu/services/>
 - 1800 Melrose Avenue, 865 974-6861, Email: omsa@utk.edu

Technical Assistance:

Blackboard, clickers, or general information technology assistance:

- <http://remedy.utk.edu/contact/>
- Help Desk: 865 974 9900 (M – F, 8:00 – 5:00)
- OIT Computer Support Service Center and Walk-In Help Desk: Commons South, 2nd floor Hodges Library
- Turning Technologies (clickers): 866 746 3015

Student Health Center:

- <http://studenthealth.utk.edu/>
- 1800 Volunteer Boulevard
- 865 974-3648

Counseling Center:

- <http://counselingcenter.utk.edu/>
- 1800 Volunteer Boulevard
- 865 974-2196
- Email: counselingcenter@utk.edu
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OTHER RESOURCES FOR STUDENTS:

- One Stop: <http://onestop.utk.edu> (start here for any question you have)
- Undergraduate Catalog: <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://bannersb.utk.edu/kbanpr/bwckschd.p_disp_dyn_sched (Schedule of classes)
- 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)
- Academic planning: <http://advising.utk.edu>