

BIOLOGY 160: Cellular and Molecular Biology

Fall 2017

Tuesdays and Thursdays 9:40 – 10:30,
Strong Hall 101

Instructor: Dr. Crystal McAlvin

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Office hours: Tuesdays and Thursdays from 11:00-12:00 pm (or by appointment)

Biological Literacy (BioLit) Sessions: BioLit Sessions will meet in Strong Hall once per week for 50 minutes each and will account for 25% of your lecture grade. You will receive a separate BioLit syllabus with additional information.

Required Texts and Materials:

- Text: Freeman, et al. 2017. Biological Science (6th ed). Pearson Publishing. This book is available at the VolShop or you can also purchase it as an e-text from Pearson Publishing directly (www.masteringbiology.com). The library also has a limited number of copies on reserve.
- Mastering Biology software: free with purchase of a new textbook at bookstore; you can also purchase the software directly from Pearson as Mastering **with** the e-text.
- Your mastering biology software should come with learning catalytics if you purchase the e-text or you can purchase it as a separate addition to masteringbiology. Access to learning catalytics is required for this course.
 - **Mastering biology course id: MBMCALVINFALL2017**

This course will be split between lecture and BioLit.

In BioLit sections, you will relate the concepts you are learning in lecture to the modern scientific investigations and discoveries being conducted by scientists. The BioLit sessions will focus on the same **five big ideas (FBIs; see below)** and **scientific practices** as the lecture course, but with a specific focus on helping students to be able to do the following by the end of the semester:

- 1) Interpret a figure.
- 2) Formulate a testable hypothesis to address a scientific question.
- 3) Synthesize information and identify patterns from the primary literature.
- 4) Evaluate data and come to a conclusion.
- 5) Use a model to make predictions.

What you should learn in this course (and for a Biology degree)

By the end of the course, you should be able to explain how scientists define and study cell biology, as well as how the **five big ideas (FBIs)** in biology relate to cell biology:

- 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.
- 4) Transformations of Energy and Matter:** All living things acquire, use, and release and cycle matter and energy for cellular / organismal functioning.
- 5) 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

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)**

How you will learn the material

- Learning results from being actively engaged with the material, repeatedly and in many forms. You are expected to come to class being 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, this includes having completed readings and mastering biology assignments as they arise. The lectures will be constructed assuming you will be responsible enough to prepare as indicated. 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 strive to focus on the most challenging concepts. In addition, the instructors will provide you with many 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, given in class will test your understanding of the concepts, NOT just your ability to memorize information.

Course Website: <http://online.utk.edu>

You will find the Biology 160 BioLit and lecture web pages by signing on to Canvas at online.utk.edu. If you don't know how to use this resource, tutorials are available at <http://online.utk.edu/>. You should check Canvas for new announcements.

You will have one course site: the same site for lecture for BioLit. You will find lecture materials and grades as well as BioLit materials and grades.

Additional Information on Required Materials

1) Mastering Biology software WITH Learning Catalytics: free with purchase of a new textbook at bookstore; you can also purchase the software directly from Pearson as Mastering **with** the e-text.

Note: you must purchase access to the eText to have access to Learning Catalytics. Please also bring a laptop, tablet, or smartphone to each and every lecture class to answer learning catalytics questions. Please let me know if you do not have access to one of these devices.

The first mastering biology assignment is due Monday night! 8/28/17 by 11:59 pm. There will be weekly (sometimes bi-weekly) mastering assignments that total up to 150 pts for Mastering biology assignments. It is YOUR responsibility to check the calendar of due dates in Mastering Biology. I will try to remind you in-class and by email, but it is your job to make sure that you complete your work on time. Late work will be penalized at 25% per day late. After four days, you cannot receive credit for an assignment.

Learning Catalytics questions will be asked randomly during the class, and may be based on previously covered material, reading assignments or any other in-class exercise I deem appropriate.

Learning Catalytics questions will be used primarily as a means to determine or track comprehension of the material. Learning Catalytics points that accrue over the course of the semester are added in to your overall score. Sometimes they will NOT be graded for accuracy and will count for "participation" points (number of points may vary). Bear in mind however that I will occasionally use Learning Catalytics as a means of quizzing for accuracy points.

You will be offered more Learning Catalytics points than necessary to account for occasional absences. For example, I will offer up to around 175-180 pts worth of Learning Catalytics points, and you need to accumulate 150 pts for full credit.

Questions will begin on Tuesday 8/29/17 as a TEST and will start to count on Tuesday 9/5/17.

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.
- I am happy to answer your e-mail questions, but allow up to 24 hours for a response. Also, once we leave our offices we may not check our 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.

There are also collaborative corners on the 2nd floor Strong Hall and quiet student study rooms on the first floor of Strong Hall.

Grading and Exams:

The following grading rubric is a very close approximation of how points will be distributed. Please be aware that this is subject to modification.

Lecture exams will consist of multiple-choice questions along with short answer questions that total up to 150 pts. The final exam will consist of multiple-choice and short answer questions totaling 200 points. BioLit, Learning Catalytics quizzes and in-class assignments will make up the remaining points.

- Two regular exams (150 pts each)	300 points
- One Final exam	200 points
- BioLit	250 points
- In-class assignments & Learning Catalytics	125 points
- Mastering Biology	125 points

Course Total: 1000 points

Exams / Quiz / Assignment Policies:

- NO make-up in-class activities, learning catalytics points, or mastering biology assignments will be given.
- There will be “extra” learning catalytics points built into the course to allow for missing classes, forgetting your device, etc.
- Mastering biology will be set up to deduct 25% per day late to account for late work or forgetting an assignment.
- 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 should contact me prior to the start of the exam. Send an e-mail!
- Make-up exams may be short answers, fill-in-the-blanks, or essay and will be scheduled at the instructor’s convenience and by their 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’ device to give them learning catalytics 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 each 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 accumulated points 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%

Statement on Disabilities

If you need course adaptations or accommodations because of a documented disability, or if you have questions about disabilities, contact Disability Services in 2227 Dunford Hall or call 974-6807 or email ods@utk.edu or visit their website at <http://ods.utk.edu/>

Academic Counseling:

Counseling Center: <http://counselingcenter.utk.edu/>
900 Volunteer Blvd
974-2196
email: counselingcenter@utk.edu

Tutoring:

The Division of Biology does not offer tutoring services. Your instructor (and lab instructor) will be happy to assist your learning (e.g. during office hours) but cannot serve as your personal tutor. Contact the Student Success Center and the Academic Support Unit of the Office of Minority Student Affairs for information about tutoring opportunities

1) The Student Success Center is a comprehensive source for information, services and resources to assist your success at UT: <http://studentsuccess.tennessee.edu/studentsuccesscenter/>
1817 Melrose Avenue
974-6641
email: studentsuccess@utk.edu

2) The Academic Support Unit of the Office of Minority Student Affairs offers some tutoring available to all students, but openings are limited and are filled quickly.
<http://omsa.utk.edu/services/>
1800 Melrose Avenue
974-6861
email: omsa@utk.edu

Technical Assistance:

For mastering biology assistance, please contact mastering biology support! You can find their number or chat with support at www.masteringbiology.com

<http://remedy.utk.edu/contact/>
Canvas, and/or general information regarding technical assistance:
Help Desk: 974-9900
OIT Computer Support Service Center and Walk-in Help Desk: Commons floor of Hodges Library

Statement on the Academic Dishonesty

Academic dishonesty of any sort will not be tolerated. This includes any action where you are misrepresenting work as your own: plagiarism, cheating on exams, copying another's work, etc. You are expected to abide by the University of Tennessee's honor statement:

"An essential feature of The University of Tennessee 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."

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.**

Penalties for academic dishonesty range from the grade of zero for the assignment to an F for the course to the filing of formal academic dishonesty charges seeking dismissal from the University.

Course Timetable

Lecture Schedule **This schedule is tentative and subject to change**	Reading Assignments (readings MUST be completed PRIOR to lecture; other readings may be assigned)
Aug 24 (R) Class Introduction, Cell Theory	Chapter 1.2
Aug 29 (T) Molecules and chemical bonds	Chapter 2.1, 2.2, and 2.5
Aug 31 (R) Water, carbon and functional groups	Chapter 2.1, 2.2, and 2.5 continued
Sep 5 (T) Biological Macromolecules: Nucleic Acids	Chapter 4.1-4.4
Sept 7 (R) Biological Macromolecules: Proteins	Chapter 3.1-3.4 *Quiz after lecture (plan to stay until 10:55 am)
Sept 12 (T) Biological Macromolecules: Proteins	Chapter 3.1-3.4 continued
Sept 14 (R) Biological Macromolecules: Carbohydrates	Chapter 5.1-5.3
Sept 19 (T) Biological Macromolecules: Lipids	Chapter 6.1-6.4, and Chapter 7.2-7.5
Sept 20 (W) Exam 1	Exam 1 6:00-7:30 pm—Location: TBA
Sept 21 (R) Membranes and membrane transport; pathway of protein production in a cell	Chapter 6.1-6.4 and Chapter 7.2-7.5 continued
Sept 26 (T) Energy and Enzymes	Chapter 8.1-8.5
Sept 28 (R) Energy and Enzymes	Chapter 8.1-8.5 continued
Oct 2 (T) Harvesting chemical energy: respiration and fermentation	Chapter 9.1-9.6
Oct 7 Fall Break	Fall Break
Oct 10 (T) Harvesting chemical energy: respiration and fermentation	Chapter 9.1-9.6 *Quiz after lecture (plan to stay until 10:55 am)
Oct 12 (R) Photosynthesis: Energy from the sun	Chapter 10.1-10.3
Oct 17 (T) Photosynthesis: Energy from the sun	Chapter 10.1-10.3
Oct 18 (W) Exam 2	Exam 2 6:00-7:30 pm—Location: TBA
Oct 19 (R) Cell cycle and cell division: organization of the chromosome and mitosis	Chapter 12.1-12.4

Oct 24 (T) Cell cycle and cancer	Chapter 12.1-12.4 continued
Oct 26 (R) Cell cycle and cancer	Chapter 12.1-12.4 continued
Oct 31 (T) Meiosis, recombination and diversity	Chapter 13.1-13.3
Nov 2 (R) Meiosis, recombination and diversity	Chapter 13.1-13.3 continued
Nov 7 (T) DNA replication: synthesis and repair	Chapter 15.1-15.5
Nov 9 (R) DNA replication: synthesis and repair	Chapter 15.1-15.5 continued
Nov 14 (T) Control of gene expression, information flow in a cell: transcription and translation	Chapter 16 and Chapter 17.1-17.4
Nov 16 (R) Transcription and translation continued	Chapter 16 and Chapter 17.1-17.4 continued *Quiz after lecture (plan to stay until 10:55 am)
Nov 21 (T) Biotechnology	Chapter 20
Nov 23 (R) No Class	Thanksgiving
Nov 28 (T) Biotechnology continued	Chapter 20 continued
Nov 30 (R) Biotechnology continued	Chapter 20 continued
Dec 5 (T)	Review
Dec 12 (T) Final Exam 8-10 am in Strong Hall 101	Cumulative—Location: Strong Hall 101