

Biology 160: Cellular and Molecular Biology (Sections 019-027)
Spring 2018

Course description: Intended for science majors. You will receive an introduction to the major biological concepts emphasizing the cellular and molecular aspects of life. Your learning will be organized along the themes of evolution; structure and function; information flow, exchange and storage; pathways and transformations of energy and matter; and systems. *Satisfies general education requirement: (NS).*

Lecture: Tuesday/Thursday, 11:10am – 12:00pm, Alumni Memorial Building AMB32

Lecture Instructors: You have two instructors for the course. Although only one will be delivering material at a time, we are working together to execute this course. We both have open walk-in hours reserved specifically for this course for you to ask questions and get additional help. Please email us at any time to set up additional times outside of these walk-in hours to meet with you.

Dr. Stephanie Madison (beginning Mar 1st)

Office: Strong Hall, 204

Walk-in Office Hours: T/R 1:00-2:00 pm

Phone: 865-974-2978

Email: smadiso2@utk.edu

Dr. Caroline Wienhold

Office: Strong Hall, 244

Walk-in Office Hours: W 10:00-12:00 pm

Phone: 865-974-8627

Email: wienhold@utk.edu

Skills of Biological Literacy (BioLit): Begins the week of January 16th. The lecture is accompanied by a Skills of Biological Literacy (BioLit) course where you will develop abilities to interpret modern scientific studies related to cellular and molecular aspects of life. You will receive a detailed BioLit syllabus from your BioLit instructor with more information. All BioLit sessions meet in Strong Hall.

BioLit Instructors: Jennifer Bourn (jbourn1@vols.utk.edu) Sections: 19,20,21 Walk-in Hour: TBA
Dana Layo (dlayo@vols.utk.edu) Sections: 22,23 Walk-in Hour: TBA
Sidney Allen (callen72@vols.utk.edu) Sections: 25,26,27 Walk-in Hour: TBA

What you should learn for a Biology degree: By the end of this course, you should be able to explain how scientists define and study cells, as well as how the **five big ideas (FBIs)** in biology listed below relate to each other and to the study of cell biology. Being able to connect new knowledge to existing knowledge by relating facts using the FBIs, and being able to interpret biological phenomena from the perspective of each FBI, will help you think like a scientist. The following list is the FBIs. In *italics* is how we will discuss them this semester.

- 1) **Evolution:** Populations of organisms and their cellular components have changed over time through both selective and non-selective evolutionary processes. *Molecular changes in genetics.*
- 2) **Structure and function:** All living systems (organisms, ecosystems, etc.) are made of structural components whose arrangement determines the function of the systems.

Structure and function of biological macromolecules; Structure and function of cells and their components.

- 3) **Information flow, exchange and storage:** Information (DNA, for example) and signals are used and exchanged within and among organisms to direct their functioning. *Organization and flow of genetic information in cells; Interactions between genes and the environment and the impact on gene expression.*
- 4) **Pathways and Transformations of energy and matter:** All living things acquire, use, and release and cycle matter and energy for cellular / organismal functioning. *Different forms of energy; Transfer and transformation of energy for cellular function in biological systems.*
- 5) **Systems:** Living systems are interconnected, and they interact and influence each other on multiple levels. *Interaction of molecules, cells, and the environment on gene expression*

You should also be proficient in the following scientific practices: Being able to complete the following skills will help you work like a scientist. These are skills you will develop in 160, 150, the laboratory course 159, and BioLit.

- 1) Develop hypotheses and predictions (ask scientific questions) based on models or data
- 2) Interpret scientific representations, such as graphs, phylogenies, or molecular structures, or data, and come to a conclusion (with evidence)
- 3) Summarize and/or synthesize scientific information verbally or in writing to an audience

Course website: <http://utk.instructure.com/> (Canvas)

You have one Canvas site for this course that hosts materials for both lecture and your BioLit section. We will use this site daily for communicating important updates and posting course materials such as assignments, slides, and grades. Check the BioLit syllabus for information on accessing BioLit material through this site.

Required materials: In addition to Canvas, we will heavily rely a textbook and the accompanying website www.masteringbiology.com, for pre-class and in-class assignments.

- 1) *Textbook:* Biological Science, 6th edition, 2016, Freeman et al., Pearson Publishing. This book is available in the bookstore as a custom 3rd edition for the University of Tennessee. Or you can purchase it as an e-Book from Pearson Publishing directly (www.masteringbiology.com). The library also has a limited number of copies on reserve.
- 2) *MasteringBiology Access:* Free when you purchase the textbook new or as an e-Book. Or you can purchase it separately from Pearson (www.masteringbiology.com). If you purchased MasteringBiology in 2017, your subscription is valid this semester, too. The course ID this semester is Biology160Spring2018.
- 3) *Learning Catalytics:* Free when you purchase a textbook new or as an e-Book. Or you can purchase it separately or in addition to MasteringBiology access.

Participation in Learning Catalytics requires a Wi-Fi enabled device during lecture. If you do not have a Wi-Fi enabled device you can bring to lecture each time, please see us immediately so that we may lend you one each lecture.

How you will learn the material:

- 1) Be prepared for lecture: Complete assigned readings and MasteringBiology assignments before each class. Read and think about the learning objectives before each class.
- 2) Participate in class discussions and activities: We include these activities to help you practice the material and master the concepts before you see similar material on the exams.
- 3) Take notes during lecture: PowerPoint slides will be numbered in the upper-right corner and will be posted on Canvas *after* each class.
- 4) Use the learning objectives: Read and think about the learning objectives before each class. Review the learning objectives after class and make sure you can answer each objective and link objectives from multiple lectures together. We design exam questions based on the learning objectives so come see us if you do not feel confident in your ability to meet each objective!
- 5) Understand the concepts, *don't just memorize*: You should devote time outside of lecture to synthesize and link the concepts together. Our exams will test your understanding of the concepts, not just your ability to memorize information (short answer will be included!).

As our students, we expect you to:

- 1) Be on time to class
- 2) Silence all cell phones during class
- 3) Ask questions and participate in class discussions; however, refrain from talking when the instructor or other students have the floor
- 4) Complete your assignments on time
- 5) Contact us early and often to review your understanding of the material

As your instructors, you should expect us to:

- 1) Begin and end class on time
- 2) Silence and stow our cell phones during class
- 3) Respond to your questions and concerns within 48 hours, or on Monday if you contact us Friday or over the weekend
- 4) Grade objectively, consistently, and return grades within a week, or two weeks for exams

How your learning will be assessed:

Lecture (75%)

Semester quizzes 1 and 2	100 points (50 points each)
Semester exams 1 and 2	200 points (100 points each)
Cumulative final exam	150 points
Written assignment	20 points
Learning Catalytics/ In-class assignments	170 points
MasteringBiology	<u>110 points</u>
	750 points

BioLit Sessions (25%)

250 points

Course total

1,000 points

Course grade will be determined by the percentage of points earned out of 1000:

A	92-100%	B	82-85%	C	71-75%	F	0-59%
A-	89-91%	B-	79-81%	C-	68-70%		
B+	86-88%	C+	76-78%	D	60-67%		

Quizzes: There are two closed-book lecture quizzes each worth 50 points. These two quizzes will be given during class and you will have the regular 50 minute class period (11:10 – 12:00) to complete each quiz. **No make-up quizzes will be given.** If an individual quiz is missed for an approved reason, the corresponding exam will be scaled to compensate. For example, if you miss Quiz 2 due to illness or a family emergency, your Exam 2 will be worth 150 points. *You must contact Dr. Madison or Dr. Wienhold prior to the start of the missed quiz to have your corresponding exam scaled, otherwise it will be a zero.*

Exams: There are two closed-book lecture exams each worth 100 points. These two exams will be given during class and you will have the whole 75 minutes for the exam (11:10am – 12:25pm). **No make-up exams will be given.** The cumulative final exam will be worth 150 points and given during the University final exam period. If an individual exam is missed for an approved reason, your final exam will be scaled to compensate for the missed exam. For example, if you miss an exam due to illness or a family emergency, your final exam will be worth 250 points. *You must contact Dr. Madison or Dr. Wienhold prior to the start of the missed exam to have your final exam scaled, otherwise it will be a zero.*

Written assignment: Details about the assignment will be posted on Canvas. The written assignment must be submitted to Canvas by **March 9th**.

Learning Catalytics/In-class assignments: Lectures include group and individual Learning Catalytics questions and short in-class assignments. These activities are designed to help us get real-time feedback on your learning, and for you to practice the material and gauge your own understanding. Each lecture beginning January 23rd, will be worth 10pts. These points will be divided among the lecture's various activities. More points (220) are available over the course of the semester than is necessary to obtain the full points (170), so occasional forgetfulness, illness, or tardiness will not seriously affect this portion of your grade. *Participation in Learning Catalytics requires you to bring a Wi-Fi enabled device to each lecture. If you do not have access to a Wi-Fi enabled device, please see the instructors so that we can lend you one.*

MasteringBiology: There is a total of 110 points from out-of-class assignments on the Mastering Biology website <http://www.masteringbiology.com> These assignments are due on Mondays and Fridays at 11:59pm. More points (120) will be available on MasteringBiology than is necessary to obtain the full 110 points. The course ID for this class is BIOLOGY160SPRING2018

Lecture Schedule

Week	Date		Topic	Reference Chapters	Due Mon 11:59pm	Due Fri 11:59pm
1	Jan. 11	R	Class introduction, What is Life	1.1 - 1.4		
	12	F	Post-week practice			MB P1
2	15	M	Pre-week reading		MB R1	
	16	T	The chemical basis of life	2.1, 2.2		
	18	R	Water, functional groups, amino acids	2.2, 2.5, 3.1		
	19	F	Post-week practice			MB P2
3	22	M	Pre-week reading		MB R2	
	23	T	Macromolecules - Nucleic acids	4.1 - 4.3		
	25	R	DNA replication	15.2 - 15.4		
	26	F	Post-week practice			MB P3
4	29	M	Pre-week reading		MB R3	
	30	T	Macromolecules - Proteins	3.1 - 3.4		
	Feb. 1	R	Quiz 1			
	2	F				
5	5	M	Pre-week reading		MB R4	
	6	T	How genes work and mutations	16.1 - 16.4		
	8	R	How genes work and mutations	16.1 - 16.4		
	9	F	Post-week practice			MB P4
6	12	M	Pre-week reading		MB R5	
	13	T	Transcription	17.1, 17.2		
	15	R	Translation	17.3 - 17.5		
	16	F	Post-week practice			MB P5
7	19	M	Pre-week reading		MB R6	
	20	T	Bacterial gene expression	18.1 - 18.5		
	22	R	Eukaryotic gene expression	19.1 - 19.6		
	23	F	Post-week practice			MB P6
8	26	M				
	27	T	Exam 1			
	Mar. 1	R	Macromolecules - Lipids	6.1, 6.2		
9	2	F	Post-week practice			MB P7
	5	M	Pre-week reading		MB R7	
	6	T	Membranes	6.3, 6.4		
	8	R	Energy and enzymes	8.1 - 8.5		
10	9	F	Post-week practice Written Assignment Due			MB P8 Written Assign
	12	M	No Class - Spring Break			

	13	T	No Class - Spring Break			
	15	R	No Class - Spring Break			
	16	F	No Class - Spring Break			
11	19	M	Pre-week reading		MB R8	
	20	T	Macromolecules - Carbohydrates	5.1 - 5.3		
	22	R	Cellular respiration	9.1 - 9.5		
	23	F	Post-week practice			MB P9
12	26	M	Pre-week reading		MB R9	
	27	T	Cellular respiration and fermentation	9.2 - 9.6		
	29	R	Quiz 2			
	30	F				
13	2	M	Pre-week reading		MB R10	
	Apr. 3	T	Photosynthesis	10.1 - 10.4		
	5	R	Photosynthesis	10.1 - 10.4		
	6	F	Post-week practice			MB P10
14	9	M	Pre-week reading		MB R11	
	10	T	Cell theory, cell cycle, and mitosis	1.2, 12.1, 12.2		
	12	R	Control of the cell cycle and cancer	12.3, 12.4		
	13	F	Post-week practice			MB P11
15	16	M	Pre-week reading		MB R12	
	17	T	DNA repair and meiosis	15.5, 13.1, 13.2		
	19	R	Exam 2			
	20	F				
16	23	M			MB R13	
	24	T	Review/TBA			
	26	R	Review/TBA			
	27	F	Post-week practice			
	May 4	F	Final Exam 10:15 - 12:15pm			

*** Supplemental readings and schedule changes will be announced in class and on Canvas.
Schedule is tentative and subject to change at our discretion.***

University deadlines:

<i>Important deadlines:</i>	Last day to drop without a "W"	January 19 th
	Last day to drop with a "W"	April 3 th
	Last day to withdrawal from UT	April 27 th

University policies:

Academic integrity: You are expected to abide by the University of Tennessee Honor Statement throughout the lecture and lab portions of this course.

"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 personal commitment to honor and integrity."

(2016-2017 Undergraduate Catalog Academic Policies and Procedures)

Academic dishonesty includes plagiarism, using multiple clickers, and assisting other students on exams, quizzes, and individual homework assignments. Depending on the offence, penalties range from a zero for the assignment to an F for the course. Official charges may also be filed which could result in dismissal from the University of Tennessee. **Students involved in using multiple log-ins for Learning Catalytics lose all in-class points for the entire semester.**

Final exam policy: "All final exams must be given during the final exam period at the scheduled time. 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."

(http://registrar.tennessee.edu/academic_calendar/finalexams.shtml)

Tennessee Education Lottery Scholarship recipients: All courses for which you are enrolled on January 19th 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."

(<http://onestop.utk.edu/files/2013/02/telsflyer.pdf>)

Campus resources:

Counseling Center: Provides personal counseling, psycho-therapy, and psychological outreach and consultation.

Website – <http://counselingcenter.utk.edu>

Location – Student Health Building, 2nd floor, M-F 8 am – 5 pm (except W 9-5)

Phone – 865-974-2196

E-mail – counselingcenter@utk.edu

Student Disability Services: If you need course adaptations or accommodations because of a documented disability, please contact SDS.

Website – <http://sds.utk.edu>

Location – Dunford Hall, Room 100, Monday-Friday, 8 am – 5 pm

Phone – 865-974-6087

E-mail – sds@utk.edu

Office of Information Technology: Offers assistance with Canvas, e-mail, and other general IT problems.

Website – <https://oit.utk.edu/Pages/default.aspx>

Location – Hodges Library, the Commons, M-R 9 am – 9 pm, Fri 9-5, Sun 4-9

Phone – 865-974-9900

E-mail – None, go to <http://remedy.utk.edu/contact/>

Office of Multicultural Student Life: The Academic Support Unit offers free walk-in tutoring and tutoring appointments for all UT students.

Website – <http://multicultural.utk.edu>

Location – Black Cultural Center, M-F 8 am - 8 pm

Phone – 865-974-6861

E-mail – multicultural@utk.edu

Student Success Center: Offers academic support for all UT students and offers free tutoring for all enrolled undergraduate UT students.

Website – <http://studentsuccess.utk.edu/about/>

Location – Greve Hall, Room 324, Monday-Friday, 8 am – 5 pm

Phone – 865-974-6641

E-mail – studentsuccess@utk.edu

Study Rooms:

Hesler #417 – quiet study room for **majors in Biology**

Neyland Biology Annex #103 – a study room for students in biology courses