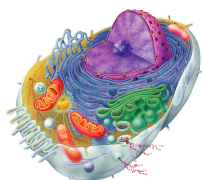


BIOL 141 QW – Cell Biology and Genetics with Lab [Fall 2018]



Lecture: MWF 2:00-2:50pm, OSB 115

Lab: T 2:30-5:30pm, OSB 325

Instructor: Dr. Emily McLean, emily.mclean@emory.edu, OSB 310

Office Hours: By appointment or Fridays from 3-4pm

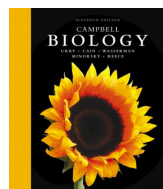
Course Objectives:

By the end of the course, students will be able to:

- *Build* the living cell from fundamental molecules and *describe* how it accomplishes the tasks required for survival
- *Understand* how cellular function and genetic inheritance provide the substrate for the diversity of life on Earth
- *Practice* observing living organisms, generating questions, and evaluating evidence (you will be a scientist)
- *Develop* laboratory techniques and *analyze* real-world data

Reading:

DO IT. Class time and exam time will require that you've read the book.

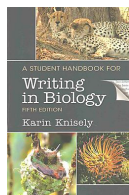


Required Lecture Text:

Campbell Biology

11th Edition

ISBN: 9780134082318

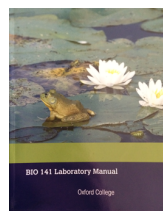


Optional Writing Book:

Writing in Biology

5th Edition

ISBN: 9781319121815



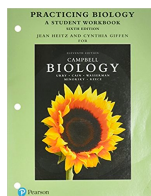
Required Lab Text:

BIO 141 Cell Biology and Genetics

Oxford-specific lab manual

available **ONLY** in the bookstore

MUST BUY NEW



Optional Workbook:

Practicing Biology

6th Edition

ISBN: 9780134486031

Attendance:

Attendance is mandatory – and really the only way you'll get the most out of this course. BIOL 141 follows the attendance policy laid out by the Biology Department, which is detailed on an additional handout.

Grades:

Exam 1	100	Scientific writing	25 (4 assignments)
Exam 2	100	Lab project	75 (proposal, presentation, and paper)
Exam 3	100	Lab exam 1	50
Final exam	175	Lab exam 2	35
		Lab exam 3	50

TOTAL: 710 points

Class policies:

- Canvas will be the primary way we communicate and share
- Laptops are more often a distraction than a learning aid – if you feel your learning is best accomplished with a laptop please come talk to me
- Cell phones should *not* be visible or audible in class
- **NEVER** hesitate to ask a question in or out of class

Disability statement: Students with disabilities who believe that they may need accommodations in the class are encouraged to contact the Office of Accessibility Services at 770-784-4690 or oas_oxford@emory.edu as soon as possible to better ensure that such accommodations are implemented in a timely fashion. Accommodations cannot be implemented until I am provided an accommodation letter and discuss the accommodation plan for this course face to face with you. All discussions with OAS and faculty concerning the nature of your disability remain confidential.

Religious Holidays Arrangements: If you anticipate religious holidays that may affect your ability to complete the requirements of this course, please make every effort to discuss your religious holiday needs with me within the first two weeks of the semester; waiting longer may compromise my ability to extend satisfactory arrangements. Emory's official list of religious holidays may be found at http://www.religiouslife.emory.edu/faith_traditions/holidays.html.

Title IX Reporting: Every Emory employee who is informed about an allegation of sexual misconduct involving any student is required to notify a Title IX Coordinator either directly or through their relevant reporting structure*. All members of the Emory community are encouraged to promptly report incidents of sexual harassment and discrimination. For more information, visit: <http://sexualmisconductresources.emory.edu/policies/index.htm>

**Employees who serve in a professional role in which communications are afforded confidential status under the law (e.g., medical providers, therapists, and professional and pastoral counselors) are not bound by this requirement but may, consistent with their ethical and legal obligations, be required to report limited information about incidents without revealing the identities of the individuals involved, to a Title IX Coordinator or Deputy Title IX Coordinator.*

Academic Integrity: In this, as in all classes at Oxford, you are expected to complete your assignments with due regard to academic integrity and to adhere to Oxford's Honor Code. In order to do so you should familiarize yourself with the honor code (<http://oxford.emory.edu/catalog/regulations/honor-code.html>). Failure to comply with these standards will be reported to the Honor Council.

The instructor reserves the right to modify this syllabus as she deems necessary.

BIOL 141 Schedule

Date	Lecture	Reading	Lab	Assignments
W – 8/29	Science as a Way of Knowing	1		
F – 8/31	Major themes in Biology	1		
M – 9/3	LABOR DAY – NO CLASS			
T – 9/4			Scientific Investigation	Introduction and reference (due beginning of next lab on 9/11)
W – 9/5	Hierarchies: beginning with living chemistry and water	2, 3		
Th – 9/6	<i>Scientific Literature Workshop 8am or 9am in OSB 101 or 115</i>			
F – 9/7	Building biological macromolecules: carbohydrates and lipids	4,5		
M – 9/10	Proteins and nucleic acids	5		
T – 9/11			Microscopes and Cells	Review table (not turned in)
W – 9/12	Structure and function revealed in cells	6		
F – 9/14	Cell biology - Problems/Case Study and <i>Strategies for Success</i>	--		
M – 9/17	Membrane structure & Cellular Transport	7		
T – 9/18			Diffusion and Osmosis	Methods and title page (due beginning of next lab on 9/25)
W – 9/19	Cellular Transport Problems	--		
F – 9/21	Fundamentals of energy transformations: enzymes, ATP and electron carriers	8		
M – 9/24	Cellular respiration I - Glycolysis	9		
T – 9/25			Enzymes	Table and figure (due beginning of next lab on 10/2)
W – 9/26	Cellular respiration II – Glycolysis and Transition	9		Fermentation proposals uploaded to Canvas by 2:30pm
Th – 9/27	EXAM I – 8:00-9:30am (through membrane transport)			
F – 9/28	Cellular respiration III – Krebs Cycle	9		
M – 10/1	Cellular respiration IV – Chemiosmosis and The Electron Transport System	9		
T – 10/2				Cellular Respiration and Fermentation (figure, results, discussion due beginning of next lab 10/16)

Date	Lecture	Reading	Lab	Assignments
W – 10/3	Review and recapitulation: Accounting Day	--		
Th-10/4			LAB EXAM 1 (thru Enzymes)	
F – 10/5	Homage to photosynthesis	10		
M-10/8	FALL BREAK – NO CLASS			
T- 10/9			FALL BREAK – NO LAB	
W – 10/10	Photosynthesis I: the light dependent reactions	10		
F – 10/12	Photosynthesis II: the light independent reactions and variations (C4 and CAM)	10		
M – 10/15	Team research proposal development part 1			
T – 10/16			Mitosis and Meiosis	
W – 10/17	Team research proposal development part 2			
Th – 10/18				Team research proposals uploaded to Canvas by 9am
F – 10/19	Cell reproduction: cell cycle, mitosis	12		
M – 10/22	Sexual life cycles and meiosis	13		
T – 10/23			Field Research : Ecology and Evolution on the Outcrops	
W – 10/24	Mendelian principles; genes and chromosomes	14, 15 pp 294-297		
Th-10/25	EXAM II – 8:00-9:30am (through photosynthesis)			
F – 10/26	Patterns of inheritance	14, pp 278-283		
M – 10/29	Chromosomal theory and linkage	15		
T – 10/30			Microbial Diversity (Bacteriology)	
W – 10/31	Genetics problems and review	14, 15		
Th – 11/1			LAB EXAM 2 (Mitosis and Meiosis)	
F – 11/2	DNA structure	16		
M – 11/5	DNA replication	16		
T – 11/6			Research Symposium	
W – 11/7	Gene to Protein I: transcription and the genetic code	17		
F – 11/9	Gene to Protein II: translation and genetic mutations	17		

Date	Lecture	Reading	Lab	Assignments
M – 11/12	Molecular genetics workshop	--		
T – 11/13			Molecular Biology	
W – 11/14	Charles Darwin and development of evolutionary concepts	22		
Th – 11/15	EXAM III – 8:00-9:30am (through molecular genetics)			
F – 11/16	Evidence for evolution	22, 25, pp 523-535		
M – 11/19	Genetic Variation, Population Genetics and Hardy-Weinberg	23		
T – 11/20			NO LAB – THANSGIVING BREAK	
W – 11/21	THANKSGIVING BREAK – NO CLASS			
F – 11/23	THANKSGIVING BREAK – NO CLASS			
M – 11/26	<i>Ask the Editors (optional research paper advice)</i>			
T – 11/27			Plant Diversity 1 and 2	
W – 11/28	Microevolution: genetic drift, gene flow and mutation	23		
F – 11/30	Evolution of land plants	29		RESEARCH PAPERS DUE AT START OF CLASS AND UPLOADED TO CANVAS
M – 12/3	Bryophytes and seedless vascular plants	29		
T – 12/4	Seed plants: gymnosperms and angiosperms	30, 38, pp 822-826		
W – 12/5				
Th – 12/6	Sexual Encounters of the floral kind	38, pp 821-829	No lab	
F – 12/7				
M – 12/10	Evolutionary trends in land plants, Big Themes Revisited	--	LAB EXAM 3 (Bacteriology, Molecular Biology and Plant Diversity 1 and 2)	

Final exam: Friday, December 14th at 9:00AM

Tips for Success: Biology 141 is an intensive course and requires time. To perform well in this course, you must develop a proper plan for managing your time and your work, beginning from the first day of class. These study habits will help you succeed in BIO 141:

- 🌿 **Keep up with assigned readings.** The readings listed for each lecture in the syllabus must be done BEFORE the lecture.
- 🌿 **Take good notes.** In lecture, I will explain the most significant concepts from your readings and present images and examples that may not be in your textbook. You are responsible for all of this information. Detailed and well-organized notes are critical for studying and learning in this course. Ask questions in class to help you connect the concepts. Review your notes after every lecture and before the next class.
- 🌿 **Connect the lecture notes to your readings.** For the test, you are responsible for information in the textbook as well as lecture material. Make sure that you are able to grasp the major concepts thoroughly and in detail. Use the summary and review sections of your textbook as well as images and diagrams from your text. In addition, connect the concepts learned in lecture to the lab exercises.
- 🌿 **Review material on a regular basis.** Study the diagrams in your text and lecture handouts. Practice writing out pathways and linking the concepts. Use the blank figures handed out in class for your study. Attend your SI sessions on a regular basis. Come see me for individual assistance.
- 🌿 **Keep two things in mind.** One - learn terminology and most importantly, understand the relevance of that terminology to biological function. Second – this course is designed to make you think and not just to have you memorize facts. Memorizing facts is important to establish a basis for your knowledge but it is not sufficient. You must be able to use your knowledge to think logically and analytically. Many of the test questions will revolve around applying your knowledge. Therefore you should be confident of what you know and what it means.
- 🌿 **Be an active learner.** Develop study guides, comparison charts, and concept maps. Complete assignments in *Practicing Biology*. Attend Supplemental Instruction and organize your own active study group. Don't be lulled into thinking familiarity is the same as knowledge. The latter takes time and an organized plan of study.
- 🌿 **Lab is equally important!** The laboratory component of this course is intensive and requires time as well. Please read your lab manual BEFORE lab and pay attention to the details. Take good notes and make detailed observations. Answer all questions in the lab manual either during lab or immediately following lab. Review the objectives and prepare a study guide for the lab materials and activities on a weekly basis. Learn to manage your time well and prepare in advance for the lab writing assignments. Pay attention to information about lab exams. Make use of open lab time.