Biology 12 Syllabus Fall 2019

Lectures
201 LSC
MWF 8:50-9:55AM, Th X-hour 9:05-9:55AM

Course Staff
Professor
Natasha Grotz, Ph.D.
231 LSC
Office Hours: Mondays 1:30-2:30PM, Thursdays 10:15-11:15AM

Lab Director
Jessica Warren, Ph.D.

Graduate Teaching Assistants
Paige Canova
Chenhui Deng
Emily Sullivan
Kaesi Morelli
TA office hours are listed on the Bio12 Lab Page on Canvas.

Teaching Fellow
Miranda Greig, '19
Review Sessions: Th 7:30-9:30PM*, Su 7:30-9:30PM
*During exam weeks, Miranda will hold review sessions on Tuesdays instead of Thursdays.
Miranda will discuss her office hours.

Course Goals and Learning Objectives

1. Become conversant in Cell Biology which involves learning the vocabulary relating to this field of study and using that vocabulary correctly.
2. Understand the experimental methods used to study cells such as different types of microscopy, biochemical and molecular analysis, and genetic approaches.
3. Gain a working knowledge of cellular organization and function including membrane structure and function, formation of cellular compartments, generation and utilization of energy, protein trafficking, cellular response to the environment, signal transduction pathways, assembly of cytoskeletal components and their regulation of cell shape and motility, cell duplication, organization in tissues and development of cancer.
4. Develop the analytical skills of a Cell Biologist.
5. Discover the inner beauty of the cell and appreciate how incredibly complex but innately beautiful cells are. Learning about their structure and function adds an extra dimension to this beauty.

Class Schedule

Lecture Number	Lecture Date	Topic	Reading
How do we view cells?			
1	9/16-M	Course Logistics & Intro to Cell Architecture	Ch. 1
2	9/18-W	Microscopy	Ch. 18
3	9/20-F	Microscopy	Ch. 18
How do we analyze cells?			
4	9/23-M	Protein Structure & Function	Ch. 2
5	9/25-W	Experimental Approaches	Ch. 18
6	9/26-Th	Experimental Approaches	Ch. 18
How are cell compartments built?			
7	9/27-F	Thermodynamics & Enzymes	Ch. 3
8	9/30-M	Membrane Structure & Composition	Ch. 4
9	10/2-W	Transport Across Membranes	Ch. 4
10	10/4-F	Transport Across Membranes	Ch. 4
	10/7-M	Exam 1 Review Session	
	10/9-W	Exam 1 (Lectures 1-10)	
How do cells generate and utilize energy?			
11	10/11-F	Glycolysis & Aerobic Respiration	Ch. 3 & Ch. 5
12	10/14-M	Photosynthesis	Ch. 6
How do proteins know where to go?			
13	10/16-W	Protein Sorting	Ch. 8
14	10/17-Th	Protein Sorting	Ch. 8
15	10/18-F	Protein Sorting	Ch. 8
16	10/21-M	Protein Sorting	Ch. 8
How do cells receive, integrate and process information?			
17	10/23-W	Cell Signaling	Ch. 15
18	10/24-Th	Cell Signaling	Ch. 15
19	10/25-F	Cell Signaling	Ch. 15
	10/28-M	Exam 2 Review Session	
	10/30-W	Exam 2 (Lectures 11-19)	
How do cells regulate shape and motility?			
20	11/1-F	Cytoskeleton-Intermediate Filaments	Ch. 9
21	11/4-M	Cytoskeleton-Actin	Ch. 9
22	11/6-W	Cytoskeleton-Actin	Ch. 9
23	11/7-Th	Cytoskeleton-Microtubules	Ch. 9
24	11/8-F	Cytoskeleton-Microtubules	Ch. 9
How do cells duplicate?			
25	11/11-M	Cytoskeleton during Mitosis	Ch. 14
26	11/13-W	Cell Cycle	Ch. 14
27	11/14-Th	Cell Cycle	Ch. 14
How do cells form tissues?			
28	11/15-F	Connections Between Cells	Ch. 7

What happens when cell biology fails?			
29	**11/18-M**	**When Cell Biology Fails**	**Ch. 16**
	11/21-Th	**Review Session, 9am-10am**	
	11/24-Su	**Final Exam (8am-11am) (Lectures 20-29)**	

Textbook

The textbook for the course (optional), Cell and Molecular Biology: Concepts and Experiments, 7th or 8th ed. by Gerald Karp.
The 8th edition is on reserve at Dana library.
For those wishing to supplement the lectures and assigned readings in Karp, the following books are also on reserve in Dana Library:
Essential Cell Biology by Alberts et al.
Molecular Cell Biology (Dartmouth Custom Book) by Lodish et al.

Web Site

The Canvas site for the course will contain PowerPoint slides used during lecture, outlines, ECHO 360 Recordings, and information from the Teaching Science Fellow.

Grading

First Exam	24%
Second Exam	24%
Final Exam	24%
Participation	3%
Lab Grade	25%

Exams will be a mixture of testing your mastery of the information and applying your knowledge to solve problems.

Barring documented illness, family emergency or academic conflict, **failure to take an exam at the scheduled time will result in a grade of zero**. Documentation of illness requires that you contact Dick's House and determine if you need treatment. You must alert me in advance of the exam if you are unable to take the exam at the scheduled time.

Participation

Note that there are 29 lectures listed on the schedule, but only 28 of these will count towards participation. Class participation will begin with Lecture 2 on Wednesday, September 18th, and will be based on written reflections that are submitted at the end of each class. Participation points will be tiered depending on your attendance so you will not be penalized for illness or other situations that prevent you from attending every class.

25-28 lectures (0-3 absences): 3 points
21-24 lectures (4-7 absences): 2 points
17-20 lectures (8-11 absences): 1 point
0-16 lectures (12+ absences): 0 points

Grading Policy for Exams

The following points summarize the grading procedures with respect to exams:

1) After the exam has been graded and returned, a copy of the answer key will be posted on the Bio12 Canvas site. Review this answer key and be sure to understand the errors in your exam and why you made them.
2) The number of points given for each answer is final. If, after reviewing your answers and comparing them to the posted answer key before the announced deadline (see below), you find an arithmetic error or detect an omission by the grader for one of the questions, you must observe the following procedures for error correction:
   - Do not write on the exam. Any alteration of the answers between the time when the graded papers were returned to the student and the time when the paper was submitted for regrading constitutes a breach of the Academic Honor Principle. To deter this practice, we scan exams before grading them.
   - Prepare a typed cover page with your name and HB number.
   - If you find an addition error, indicate on the cover page that an addition error has occurred. Specify the page and question number.
   - If you determine that your answer contains all of the information indicated in the key but you did not receive full credit, simply indicate the number of the question to be re-evaluated and state in one or two short, descriptive sentences (typed) what makes your answer correct. The citation of a text page, diagram, or reference to a lecture date/number may also be helpful.
   - Attach the typed cover sheet to your complete exam and return it before the announced deadline to the Bio12 drop box located outside the lab (LSC 202).

Error correction requests must be hand-delivered to the Bio12 drop box before these deadlines:
First Exam: 12:00PM (Noon) on October 14
Second Exam: 12:00PM (Noon) on November 11
We will not accept questions regarding errors in grading after these deadlines.
Once the error correction process is complete, you will be notified of the place and time to pick up exams after the re-evaluation is completed.

Final Words about Grading and Exams

You are not competing against each other for grades in Bio12. All grades up recorded as numerical grades from 0% to 100%. Letter grades are not assigned to individual exams or assignments.

Here are three important points about grades in Bio12:

[i] A grade of 90% or above will always be at least an A-. No one is ever penalized for learning what we teach them. Thus, it is entirely possible for everyone in the class to receive a grade of A- or better. That said, this is unlikely to occur.

[ii] In order to pass the class (achieve at least a D), you must achieve a final grade of at least 50%. In other words, a final grade less than 50% will result in a failing grade (E).

[iii] The median grade of Bio12 will mostly likely be a B. That means if the median numerical score for the course were 62%, then a grade of 62% would be a B. If the median were 29%, then a grade of 29% would be a B (hence negating rule [ii] above). However, if the median grade were 94% then a grade of 94% for the course would be an A/A- (see rule [i] above).

Academic Honor

The Academic Honor Principle (https://students.dartmouth.edu/judicial-affairs/) states, "Fundamental to the principle of independent learning are the requirements of honesty and integrity in the performance of academic assignments, both in and out of the classroom. Dartmouth operates on the principle of academic honor, without proctoring of examinations. Any student who submits work which is not his or her own, or commits other acts of academic dishonesty, violates the purposes of the college and is subject to disciplinary actions, up to and including suspension or separation."

There are a number of situations in which a student in Bio12 might find themselves tempted to violate the Academic Honor Principle. These situations include, but are not limited to, the following:

a) Examinations must be completed without reference to materials other than those provided with the exam paper and must be completed without communication with anyone else; the only permissible exception is that students may request clarification of any exam question from the course instructor who is present expressly for that purpose. The answers that you provide must be entirely your own work.

b) Our policy permits the re-submission of exams for potential error correction by the instructor. Any alteration of the answers between the time when the graded papers were returned to the student and the time when the paper was submitted for re-grading constitutes a breach of the Academic Honor Principle. To deter this practice, we scan exams before grading them.

c) Science is a collaborative field, and we encourage collaboration for many aspects of the course while still requiring demonstration that each individual has an understanding of key concepts. You will work with a partner during the laboratory sessions to perform all in-lab activities including microscopy, data collection, and hypothesis generation. We encourage you to collaborate with your partner and peers in the analysis of your data, including discussion of data presentation and interpretations. While the ideas and overall interpretations may result from collaboration, we require that the textual and graphical content of any lab report submitted for grading is prepared by you individually without the assistance of anyone else.

d) Your participation grade will be based on your reflection at the end of the class period and submission of a written document. It is a violation of the Honor Principle to have a friend submit a reflection document for you or for you to submit a document for your friend.

Honesty is the foundation of the academic pursuit of knowledge. In recognition of this, the faculty will not overlook any violations of the Academic Honor Principle.

Note to Students with Physical or Learning Disabilities

Students with disabilities who may need disability-related academic adjustments and services for this course are encouraged to see me privately as early in the term as possible. Students requiring disability-related academic adjustments and services must consult the Student Accessibility Services office (Carson Hall, Suite 125, 646-9900). Once SAS has authorized services, students must show the originally signed SAS Services and Consent Form and/or a letter on SAS letterhead to their professor. As a first step, if students have questions about whether they qualify to receive academic adjustments and services, they should contact the SAS office. All inquiries and discussions will remain confidential.

Mental Health

The academic environment at Dartmouth is challenging, our terms are intensive, and classes are not the only demanding part of your life. There are a number of resources available to you on campus to support your wellness, including your undergraduate dean (http://www.dartmouth.edu/~upperde/), Counseling and Human Development (http://www.dartmouth.edu/~chd/), and the Student Wellness Center (http://www.dartmouth.edu/~healthed/).

Religious Observances

Some students may wish to take part in religious observances that occur during this academic term. If you have a religious observance that conflicts with your participation in the course, please meet with me before the end of the second week of the term to discuss appropriate accommodations.

Sexual Misconduct and Title IX

At Dartmouth, we value integrity, responsibility, and respect for the rights and interests of others, all central to our Principles of Community. We are dedicated to establishing and maintaining a safe and inclusive campus where all have equal access to the educational and employment opportunities Dartmouth offers. We strive to promote an environment of sexual respect, safety, and well-being. In its policies and standards, Dartmouth demonstrates unequivocally that sexual assault, gender-based harassment, domestic violence, dating violence, and stalking are not tolerated in our community.

The Sexual Respect Website (https://sexual-respect.dartmouth.edu) at Dartmouth provides a wealth of information on your rights with regard to sexual respect and resources that are available to all in our community.

Please note that, as a faculty member, I am obligated to share disclosures regarding conduct under Title IX with Dartmouth's Title IX Coordinator. Confidential resources are also available, and include licensed medical or counseling professionals (e.g., a licensed psychologist), staff members of organizations recognized as rape crisis centers under state law (such as WISE), and ordained clergy (see https://sexual-respect.dartmouth.edu/reporting-support/all-resources/confidential-resources).

Should you have any questions, please feel free to contact Dartmouth's Title IX Coordinator (Kristi.Clemens@Dartmouth.edu) or Title IX Office (TitleIX@Dartmouth.edu).

Financial Challenges

If you encounter financial challenges related to this class, please let me know.

Resources for Assistance

1) ECHO 360 recordings of the lectures, providing the technology does not fail, will be available on the Canvas site.
2) Professor Grotz has office hours twice each week.
3) The Bio12 Teaching Assistants are Ph.D. students at Dartmouth and are an excellent resource for information. Each Teaching Assistant will have weekly office hours.
4) Miranda Greig '19 will serve as a Teaching Science Fellow for Bio12 this term. She will be hosting review sessions on Thursdays* 7:30-9:30PM & Sundays 7:30-9:30PM (*Tuesdays &

Sundays the weeks of exams), providing supplementary study material for the course, and acting as a peer-mentor resource for the class to help with mastery of material. Feel free to contact her with questions or concerns about the course or to set up a time to meet outside of office hours. You may email Miranda at Miranda.Marie.Greig@dartmouth.edu.

5) Join a study group through the Academic Skills Center or form your own.

Laboratory Exercises

A complete laboratory syllabus is available on the Canvas BIOL 012 Lab FA19 website. Please read it carefully. You are responsible for its contents.
A brief summary of lab information for this course is provided below.

Laboratory Grades

Your work in the laboratory will contribute to 25% of your overall grade in Bio12. The lab grade will be composed as follows:

Assignment	**Percentage**
Pre-Lab Quizzes (5 quizzes, Labs 1-5)	10%
In-Lab Microscopy Assignment (Lab 1)	10%
Chromatography Assignment (Lab 2)	15%
Protein Gel Assignment (Lab 3)	15%
Chloroplast Report (Lab 4)	15%
Cell Motility Abstract (Lab 5)	10%
Experimental Design Report (Lab 6)	25%

Laboratory Section Assignment

By noon on September 18th, you will need to fill out an online survey (Canvas BIOL 012 Lab FA19) to determine your lab section based on your academic schedule. Conflicts of an academic nature will take priority, followed by work and extracurricular activities. Your lab section assignment will be the same for the entire term, and it is your responsibility to ensure that you will be in attendance for all sessions. Be sure to check all exams and X-hours for your other classes throughout the term.

There will be four Bio12 lab sections offered this term:
Tuesday: 2:25-6:25PM
Tuesday: 6:30-10:30PM
Wednesday: 2:25-6:25PM
Thursday: 6:30-10:30PM

Lab Dates, Assignments & Lab Reports

Be sure to check the Canvas calendar regularly throughout the term for any changes.

Lab	Date	Assignments	Assignment Due Dates
Lab 1 – Microscopy	Sept. 24-26	Pre-lab Quiz	Sept. 24-26 on Canvas before Lab 1
		In-lab Microscopy Assignment	Sept. 24-26 at the end of Lab 1
Lab 2 – Ion Chromatography	Oct. 1-3	Pre-lab Quiz	Oct. 1-3 on Canvas before Lab 2
		Ion Chromatography Assignment	Oct. 15-17 on Canvas before Lab 3
No Lab Oct. 8-10 (Week of Exam 1)			
Lab 3 – Gel Electrophoresis	Oct. 15-17	Pre-lab Quiz	Oct. 15-17 on Canvas before Lab 3
		Protein Gel Assignment	Oct. 22-24 on Canvas before Lab 4
Lab 4 – Hill Reaction	Oct. 22-24	Pre-lab Quiz	Oct. 22-24 on Canvas before Lab 4
		Lab Report	Nov. 5-7 on Canvas before Lab 5
No Lab Oct. 29-31 (Week of Exam 2)			
Lab 5 – Cell Motility	Nov. 5-7	Pre-lab Quiz	Nov. 5-7 on Canvas before Lab 5
		Lab Abstract	Nov. 12-14 on Canvas before Lab 6
Lab 6 – Experimental Design	Nov. 12-14	Lab Report	Nov. 17-19 on Canvas at noon (5 days after your lab section)