



BB314

CELL AND MOLECULAR BIOLOGY

FALL 2019

INSTRUCTIONAL TEAM AND COURSE DETAILS

LECTURES: T/TH 2-3:20PM **RECITATION:** 1 HR/WEEK (SEE INDIVIDUAL SCHEDULES)

CREDIT HOURS: 4

INSTRUCTOR: Dr. Lauren Dalton (Biochemistry and Biophysics) **E-MAIL:** lauren.dalton@oregonstate.edu.

COMMUNICATION: For questions about the course content, please post your messages on the discussion forum (can be accessed through Canvas). For personal matters please email me and I will reply to set up a meeting or address your concern. I try to respond to discussion posts and emails within 48 hours except weekends and holidays.

TAS: Heather Forsythe and Kasie Baker **STUDY HOURS:** TAs = TBA ; Instructor T 3:30-5pm, W 1-2pm, Th 9:30-11am

COURSE DESCRIPTION

This course explores the fundamental concepts of prokaryotic and eukaryotic cell biology and emphasizes cell structure and function at the molecular level.

PRE-REQS: ((BI 211 or BI 211H) and (BI 212 or BI 212H) and (BI 213 or BI 213H) and (CH 331* or CH 334*))

*Course may be taken concurrently

WHY STUDY CELL BIOLOGY

Cell and Molecular Biology, as you can probably guess, deals with how organisms function at the cellular and molecular level. Why do we care about knowing how organisms work at this level? Cells are considered the building blocks to life. It is the simplest unit that we can consider alive. Some simple organisms are composed of just a single cell, while others, like us, are made of trillions of cells working together. In reality then, no cell, no organism period. So, if we want to understand living things, it makes sense to understand the universal common unit of life, the cell.

MY CLASSROOM PHILOSOPHY

My goal for this that everyone in the learning community feels welcomed, supported, and intellectually challenged as we engage in cell and molecular biology content. We will be active in the classroom and engage with each other to learn. If at any point you feel that the classroom environment makes you uncomfortable, please reach out to me or to a TA so that we can ensure that everyone feels that they have a place at the table.

The university also has guidelines specified for student conduct in the classroom. From the university policy explained in **Office of Student Conduct: Information and Regulations**.

Students are expected to conduct themselves in the course (e.g., in class, on discussion boards, email) in compliance with the university's regulations regarding civility. Civility is an essential ingredient for academic discourse. All communications for this course should be conducted constructively, civilly, and respectfully. Differences in beliefs, opinions, and approaches are to be expected. In all you say and do for this course, be professional. Please bring any communications you believe to be in violation of this class policy to the attention of your instructor.

COURSE LEARNING GOALS

1. Correctly use scientific vocabulary to demonstrate core knowledge of the organization, mechanisms, and flow of cellular life.
2. Explain how structure dictates function with respect to cell behaviors at all levels of cell biology.
3. Integrate the concepts of cell and molecular biology to explain how genetic variation/mutation influences cell behavior and contributes to the diversity of life.
4. Integrate the concepts of cell and molecular biology to assess scientific data and propose explanations/solutions that fit the scientific data presented.
5. Interpret current primary literature in cell biology and communicate key findings by writing about a primary research article.
6. Participate and actively contribute to a community of learning, by working collaboratively and learning to build consensus answers.

COURSE CREDIT HOURS

This course requires approximately 12 hours/week of instruction, quizzes, recitations, and practice problems for 4 credits over 10 weeks.

COURSE FORMAT

- This course consists of 8 units, each covering a single topic in cell biology. For each of the units, you are expected to complete a pre-quiz, attend and participate in class, and attend recitation and work on problem sets.
 - Students are expected to come to class prepared. Recordings of any kind (audio OR video, including photographs or videos on your phone) are not allowed without express permission in advance.
 - Online material is provided to the student through Canvas and Piazza for the sole purpose of private study and research by the individual student. It may not be shared or sold for profit to any other individuals, companies, or websites by students as it is protected under copyright.
- You should expect to *engage* with the course content, and to *participate*. The focus of BB314 is conceptual learning and development of problem-solving skills, which takes practice. Working together with your peers will greatly facilitate the learning process.
- See the final page of the syllabus for the lecture breakdown for course topics.

COURSE MATERIALS

COURSE WEBSITE

This course will have a companion site *via* **Canvas** where you will access the learning materials, such as the syllabus, class discussions, assignments, and quizzes. Students are expected to consult the site regularly, to keep informed of any announcements and/ or changes.

TEXTBOOK

There are assigned readings given from our textbook Alberts et al. *Essential Cell Biology* 5th edition but the 4th and 3rd editions would also be an acceptable resource. There are several versions available including ebook and hard copy which are all fine to use.

TOPHAT

We will be using the Top Hat (www.tophat.com) classroom response system in class. You will be able to submit answers to in-class questions using Apple or Android smartphones and tablets, laptops, or through text message.

Top Hat requires a paid subscription. A full breakdown of all subscription options available can be found here: www.tophat.com/pricing.

You can visit the Top Hat Overview (<https://success.tophat.com/s/article/Student-Top-Hat-Overview-and-Getting-Started-Guide>) within the Top Hat Success Center which outlines how you will register for a Top Hat account, as well as providing a brief overview to get you up and running on the system.

An email invitation will be sent to you by email, but if don't receive this email, you can register by simply visiting our course website. Note: our Course Join Code is **287430**

Should you require assistance with Top Hat at any time, due to the fact that they require specific user information to troubleshoot these issues, please contact their Support Team directly by way of email (support@tophat.com), the in app support button, or by calling 1-888-663-5491.

PIAZZA

We will be using Piazza a discussion platform to facilitate questions outside of class. I encourage you to ask questions about problem sets and concepts from class there. The TAs and I will monitor the board and provide input when necessary but generally it is a platform for you to help each other learn. To access, you can select the link in the Canvas Course and follow the directions.

GRADESCOPE

Your exams will be scanned electronically and graded using Gradescope. This enhances the instructor/graders ability to provide comments. Once exams are graded you will be able to login and have an electronic record of your exam. More information to follow.

EVALUATION OF STUDENT PERFORMANCE

The course grade is based upon the following for BB314

- Midterm 30%
- Comprehensive Final Exam 40%
- Pre-Quizzes 5%
- Recitation 20%
- In class participation 5%

Total 100%

These components are explained below in greater detail.

LETTER GRADE

Grade	Percent Range
A	85-100
A-	80-85
B+	77-79
B	73-76
B-	70-72
C+	67-69
C	63-66
C-	60-62
D+	57-59
D	53-56
D-	50-52
F	<50

EXAMS

- The midterm is on **Tuesday Nov 5th, in class**. Students should make every effort not to miss the exam. If your absence was unanticipated (i.e. unexpected illness), you must notify your instructor within 24 hours of the exam and have proper medical documentation.
- Both the midterm and final are mandatory. The final exam will be cumulative, with an emphasis on material taught after the midterm.
- Both midterm and final exams will contain a combination of questions, including short answer, data analysis and formation of a well-supported argument. See the Learning Outcomes for each Unit for a summary of material for which you are responsible. We **STRONGLY** recommend using the Problem Sets to prepare.
- You may bring a single page memory aid (**entirely handwritten, double-sided, 8.5x11"**) to the midterm and the final, which will be handed in with the exam. Students that bring a memory aid that does not conform to these rules will have it taken away for the duration of the exam, and it may not be returned to them afterwards.
- **Note:** In order to pass the course, you must receive a passing grade from the aggregate score of the **midterm and the final**. In other words, the midterm and the final are worth 70 points collectively. You must receive a score of 35.5/70 or higher to be allowed to pass the course. Pre-quizzes, recitations and in-class participation cannot help you pass the course.

PRE-QUIZZES

There are 7 Content Review Quizzes throughout the term which are open book and have unlimited time. The highest 6 scores will be counted towards your final grade. The purpose of the quiz is to help students to stay engaged with basic knowledge from the readings, lectures, and pre-requisite review knowledge. Reviewing topics learned in introductory classes is one of the most powerful ways for students to enhance their learning in this course. The topics on the quiz, as well as resources that can be used for review will be provided. *Students may take each quiz twice*, with the highest score used in computing their quiz grade. This allows students to identify the things that they did not know the first time and review the material again before a second attempt.

RECITATION

Recitations— 8% of final grade

The Recitation Workshops are designed to support your learning of skills Cell and Molecular Biology, such as critical thinking, problem-solving and data analysis. In each workshop, you will practice these skills by working through sample problems from old exams individually, in groups, and through facilitated discussion with your TA.

There are 9 workshops in total. This means that you can miss **ONE** recitation without penalty (not that we recommend missing any). Beyond this, there will be absolutely no accommodations made for missing a tutorial, regardless of the reason, due to the condensed nature of the course.

Writing Assignment – 12% of final grade

A second major objective of recitation is the development of scientific literacy. As such, we will be asking you to do a writing assignment that will require you to look at scientific literature and compare it to how the media presents science.

IN-CLASS PARTICIPATION

TopHat is required for all students in lecture and will be used to facilitate discussion/monitor comprehension. You must use your own TopHat system in class in order to have your participation counted. Do not ask another person to do your TopHat in class for you and do not use another student's. Misuse will result in 0 marks and you will be reported for [academic misconduct](#).

Participation can include TopHat participation, handouts, homework, and/ or discussion board posting, at the discretion of your lecture instructor. If you participate in **>85% of classes**, you will receive full participation marks. These grades cannot be exempted or made up outside of class.

ADDITIONAL COURSE POLICIES

LATE WORK

Late work is accepted with a 10% penalty per day late up to 3 days late then it will not be accepted for credit.

INCOMPLETES

Incomplete (I) grades will be granted only in emergency cases (usually only for a death in the family, major illness or injury, or birth of your child), and if the student has turned in ~80% of the points possible (in other words, usually everything but one exam). If you are having any difficulty that might prevent you completing the coursework, please don't wait until the end of the term; let me know right away.

STATEMENT REGARDING STUDENTS WITH DISABILITIES

Accommodations are collaborative efforts between students, faculty and **Disability Access Services (DAS)** with accommodations approved through DAS are responsible for contacting the faculty member in charge of the course prior to or during the first week of the term to discuss accommodations. Students who believe they are eligible for accommodations but who have not yet obtained approval through DAS should contact DAS immediately at 541-737-4098.

ACADEMIC INTEGRITY

Students are expected to comply with all regulations pertaining to academic honesty. For further information, visit *Avoiding Academic Dishonesty*, or contact the office of Student Conduct and Mediation at 541-737-3656.

OAR 576-015-0020 (2) Academic or Scholarly Dishonesty:

a) Academic or Scholarly Dishonesty is defined as an act of deception in which a Student seeks to claim credit for the work or effort of another person, or uses unauthorized materials or fabricated information in any academic work or research, either through the Student's own efforts or the efforts of another.

b) It includes:

(i) **CHEATING** - use or attempted use of unauthorized materials, information or study aids, or an act of deceit by which a Student attempts to misrepresent mastery of academic effort or information. This includes but is not limited to unauthorized copying or collaboration on a test or assignment, using prohibited materials and texts, any misuse of an electronic device, or using any deceptive means to gain academic credit.

(ii) **FABRICATION** - falsification or invention of any information including but not limited to falsifying research, inventing or exaggerating data, or listing incorrect or fictitious references.

(iii) **ASSISTING** - helping another commit an act of academic dishonesty. This includes but is not limited to paying or bribing someone to acquire a test or assignment, changing someone's grades or academic records, taking a test/doing an assignment for someone else by any means, including misuse of an electronic device. It is a violation of Oregon state law to create and offer to sell part or all of an educational assignment to another person (ORS 165.114).

(iv) **TAMPERING** - altering or interfering with evaluation instruments or documents.

(v) **PLAGIARISM** - representing the words or ideas of another person or presenting someone else's words, ideas, artistry or data as one's own, or using one's own previously submitted work. Plagiarism includes but is not limited to copying another person's work (including unpublished material) without appropriate referencing, presenting someone else's opinions and theories as one's own, or working jointly on a project and then submitting it as one's own.

c) Academic Dishonesty cases are handled initially by the academic units, following the process outlined in the University's Academic Dishonesty Report Form, and will also be referred to SCCS for action under these rules.

OSU STUDENT EVALUATION OF TEACHING

Course evaluation results are extremely important and are used to help me improve this course and the learning experience of future students. Results from the 19 multiple choice questions are tabulated anonymously and go directly to instructors and department heads. Student comments on the open-ended questions are compiled and confidentially forwarded to each instructor, per OSU procedures. The online Student Evaluation of Teaching form will be available toward the end of each term, and you will be sent instructions via ONID by the Office of Academic Programs, Assessment, and Accreditation. You will log in to "Student Online Services" to respond to the online questionnaire. The results on the form are anonymous and are not tabulated until after grades are posted.

COURSE SCHEDULE:

Wk	Date	Unit	Lecture Topics	Recitation Schedule
0	Th Sep 25	<u>Unit 1:</u> Introduction & Microscopy	Introduction & start of Unit 1 Topic 1	No Recitation this week
1	T Oct 1		Unit 1 – 1.2 Microscopy	Unit 1 Problem-Solving – Microscopy and Organelles
	Th Oct 3	<u>Unit 2:</u> Biological Membranes	Unit 2 – 2.1 Features of Membranes & 2.2 The Lipid Bilayer	
2	T Oct 8		Unit 2 – 2.2 The Lipid Bilayer and 2.3 Membrane Proteins	Unit 2 Essay Outline Practice – Lipids
	Th Oct 10	Unit 2.3: Membrane Proteins		
3	T Oct 15	<u>Unit 3:</u> Nuclear Structure & Function	Unit 3 – 3.1 Nuclear structure & Protein Import into the Nucleus	Unit 2 Problem Solving – SDS-PAGE Experiments
	Th Oct 17		Unit 3 – 3.2: Chromatin & Chromosomes	
4	T Oct 22	<u>Unit 4:</u> Endomembrane System	Unit 3 – 3.3 Gene Expression	Unit 3 Problem Solving – Nuclease Digestion Experiments
	Th Oct 24		Unit 4 – 4.1 Introduction & Protein Import	
5	T Oct 29	Unit 4 – 4.2 Vesicle traffic & 4.3 Secretion	Unit 4 Problem Solving – Biochemical Golgi Experiments	
	Th Oct 31	Unit 4 – 4.4 Post-Golgi Traffic, Lysosomes		
6	T Nov 5	MIDTERM EXAM		Unit 5 Essay Outline Practice – pH and function
	Th Nov 7	<u>Unit 5:</u> Mitochondria & Chloroplasts	Unit 5 - Mitochondria and Chloroplasts	
7	T Nov 12	<u>Unit 6:</u> Cytoskeleton	Unit 6 – 6.1 Intro & Intermediate Filaments	Unit 6 Problem Solving – Dynamic Instability
	Th Nov 14		Unit 6 – 6.2 Microtubules & 6.3 Actin	
8	T Nov 19	<u>Unit 7:</u> Cell Signaling	Unit 7 – 7.1 General Signaling and 7.2 Ion-Gated Channels	Unit 7 Problem Solving – Cell Signaling
	Th Nov 21		Unit 7 – 7.3 GPCRs and 7.4 Enzyme Coupled-Receptors	
9	T Nov 26	<u>Unit 8:</u> Cell Cycle	Unit 8 – 8.1 Cell Cycle	No recitations this week
	Th Nov 28		Thanksgiving Holiday-no class	
10	T Dec 3	Unit 8 – 8.2 Cyclins	Unit 8 Problem Solving – Cell Cycle & Checkpoints	
	Th Dec 5	Unit 8 – 8.3 Mitosis		
Dec 9-13			FINAL EXAMS	