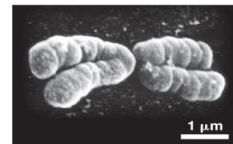


BI 211 General Biology I: Cells
Course Syllabus Winter 2021



Instructor Information

Dr. Nicola Barber

In this extraordinary time, I am committed to our course—to experiencing our course material together, learning, questioning, and growing as a class community, even given our physical distance. I recognize that many of us are experiencing difficulties in our lives that include concerns for our own physical and mental health and the health of loved ones. We are also facing unprecedented uncertainty in many facets of our lives and with that comes stress, anxiety and fear. Please do not hesitate to reach out to me if you are experiencing challenges that are impacting your ability to fully participate in this course. I will do my best to support you and offer assistance when I can.

Email is the best way to communicate with me at nbarber@uoregon.edu. Please include BI 211 in the subject line. I will host “live” office hours through Zoom each week on Wednesdays & Fridays from 1:00-2:00 pm. I welcome meetings outside my regular office hours too, knowing that there is considerable uncertainty in all of our lives right now. Just email me to set a time. If you contact me with a question, I will do my best to respond within one business day.

There is also a running discussion forum on our Canvas site called “class questions and answers” for the whole class to ask and answer.

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Course Description

In this first course of the general biology sequence, we study biological processes from a molecular and cellular perspective. These concepts are central to understanding all other areas of biology. All organisms must accomplish two major functions: 1) extract energy from their environments to build and maintain their bodies, and 2) reproduce themselves. We start by studying the four types of biological macromolecules that build organismal bodies: carbohydrates, lipids (e.g., fats), proteins and nucleic acids (e.g., DNA). We then examine how cells obtain from the environment the building blocks for constructing these macromolecules and the energy for manipulating them to carry out body functions. Next we examine reproductive functions, beginning with the two types of cell division, mitosis and meiosis. From there we study genetics, how traits pass from parent to offspring, starting with the structure and replication of DNA followed by how genes code for proteins. Finally, we look at the genetic basis of inheritance, including Mendelian genetics, pedigree analysis and the genetics of complex traits. Many of these topics are taught using a case-study approach, mostly using examples of genetic diseases in humans. BI 211 is a prerequisite for all the other general biology courses in the sequence (BI 212, BI 213, and BI 214).

Course Outcomes

The goals for BI 211 fall into two general categories: (1) to learn the foundational concepts related to cellular and molecular biology and (2) to develop skills in analytical thinking that will serve students in subsequent biology classes (and courses in other subjects) and scientific research experiences as they progress through their academic program.

Concept-based goals:

- To describe the chemical structures and major functions of the four major types of large biological molecules that make up all living organisms.
- To learn the major groups of life on Earth; to compare and contrast the different types of cells found in living systems; to identify the major structures in cells and describe their functions.
- To understand energy harvest pathways, including cellular respiration, fermentation and photosynthesis, and their relevance to human disease.
- To describe and illustrate chromosomal and cellular events during the various stages of both mitosis and meiosis, with a focus on their roles in cancer and Down Syndrome.
- To understand and describe the major processes involved in gene action, including the mechanisms of protein synthesis, comprising transcription and translation, and how they are controlled.
- To understand the relationship between phenotype and genotype and solve problems by applying rules that govern inheritance.

Skill-based goals:

- To develop competency in the basic terminology and methodologies used in the biological sciences.
- To learn the process of scientific inquiry and its applications.
- To learn how to learn about biology.

Course Structure

Our class will communicate through our Canvas site. Announcements and emails are archived there and automatically forwarded to your UO email, and can even reach you by text. Check and adjust your settings under Account > Notifications.

Log into canvas.uoregon.edu using your DuckID to access our class. If you have questions about accessing and using Canvas, visit the [Canvas support page](#). Canvas and Technology Support also is available by phone or live chat: [541-346-4357](tel:541-346-4357) | livehelp.uoregon.edu

Each week of the course is comprised of three modules: **an overview**, which includes a preview of the week's major topic(s), the week's problem sets and resources for class sessions (handouts); **classes**, which includes the week's reading assignments and "lecture" videos; and **activities and assignments**, the week's lab handouts, graded group problem set and any other assignments and/or tests for that particular week.

Reading assignments are from an open-access textbook: www.openstax.org/details/books/biology-2e. In addition to reading the assigned pages, you will be asked to post a reflection on the reading to a group discussion board. More details on this part of the class are provided on Canvas.

The "lecture" videos roughly correspond to the content we would cover in each lecture if we were meeting face-to-face this quarter and are interspersed with quiz questions that must be answered as your progress through the videos. While remote, lectures have been designed to facilitate active participation with the material. Your active participation will help you to understand the material and better prepare you for exams.

The course uses a “forced progression” structure, which requires students to complete steps of the course in sequence before moving onto the next. For example, students must view each page, complete each quiz, in the **overview** module before moving onto the **classes** module. Weekly modules will be available in advance for flexibility.

The **labs** for the class will meet synchronously and we ask that you attend the section for which you are registered. Each lab section will be team taught typically by a Graduate Employee (GE) and a Biology undergraduate lab assistant (BULA). Attendance is mandatory since we consider labs to be an integral part of the course. In lab, you will explore the diversity and complexities of cells, model major concepts in cellular biology, discuss issues related to cellular biology, and perform scientific investigations to understand the mechanisms of inheritance. In addition to these lab activities, some time each week will be spent working in small groups on the weekly graded problem set (see problem sets for more details). Lab handouts and problem sets are available in the **activities and assignments** module for each week. Each lab will be graded on a 10-point scale. Part of this grade will be based on participation in lab.

Help sessions (instructor & GE office hours, BTU tutor sessions): times will be posted on Canvas week 1.

Course Assessments

In addition to the **discussion board posts** following each reading assignment, the **quizzes** that are part of the “lecture” videos and the **lab** submissions, your course grade will include the follow other kinds of assessments.

Problem Sets

There are two types of problem sets for you to do this term. Each week’s module has both a set of **practice problems** (ungraded; not turned in) and a **group problem set** (turned in and graded). Practice problem sets are very similar to the types of questions you will see on the exams (in fact, many of the problems are from past exams) and are designed to help you master the material needed to do well on the exams. The practice problem sets will also help prepare you for the graded group problem sets. We will help you learn how to solve these problems in the help sessions. The graded group problem sets will be completed while working in groups of 4-5 students. Groups will be formed in your lab sections and you will stay in your group for the entire term. Groups will have time in lab each week to begin working on the week’s problem set, but it’s expected you will also need to schedule time outside of lab to complete the problem set. Each group will submit one problem set.

Metacognitive assignments

There will be five metacognitive assignments throughout the term (due in odd weeks). Metacognition is “thinking about one’s thinking and refers to the processes used to plan, monitor, and assess one’s understanding and performance. One of the skill-based learning outcomes for this class is to “learn how to learn Biology”. We hope to facilitate building this skill with the use of metacognition assignments.

Surveys

There will be four surveys throughout the term, including one at the start of the term to facilitate building our class community, a midterm evaluation, and surveys to assess your attitudes about several aspects of learning. All surveys will be administered through Canvas.

Exams

This course has five exams (four tests and a final exam). All exams will use the same format in Canvas “quizzes” and will be a combination of cumulative multiple-choice styles questions and open-ended short-answer problems. Exams will cover material from all aspects of the course including lectures, labs, and readings. Exams will probe a deep understanding of the concepts and principles discussed, not merely a recitation of facts, and an ability to apply the concepts to novel situations, rather than a memorization of detail. The final exam is scheduled for Monday March 15 time TBD. The exam portion of your grade will be calculated two ways and we will automatically use whatever way gives you the highest grade. Version 1 will give a higher number of points for the midterms and lower points for the final. Version 2 counts the midterms less and the final more. See the Evaluation table below for the exact breakdown. For both versions the lowest score of the four tests will be dropped. If you miss a test for a family or medical emergency, this will be the score that is dropped. If you have an ongoing crisis that causes you to miss more than one test, contact me in order to discuss your situation.

Exam regrade policy To be fair to all students, it is essential that all exams be graded according to the same criteria. If you wish to submit a midterm for a regrade, you must do the following: 1) refer to the exam key available on canvas to compare your answer to the key; 2) if you still wish to have a midterm exam answer regraded, you must submit to your instructor a written statement within one week of the return of the exam explaining specifically why your answer merits a higher score. Please do not abuse this policy. We reserve the right to eliminate this option at our discretion. Simple addition or subtraction errors can be handled by any staff without a formal regrade request.

How your grade will be determined

Component	Percent	Points (1000 total)
Lab activities (10 total; lowest score dropped; 10 pts each)	9%	90
Reading assignment discussion questions (2/week = 20 total; 2.5 pts each)	5%	50
Lecture Quizzes (3/week = 30 total; 5 pts each)	15%	150
Metacognitive assignments (biweekly; 5 total; 10 pts each)	5%	50
Graded Problem Sets (1/week = 10 total, 15 pts each)	15%	150
Course surveys (5 total; 2 pts each)	1%	10
Midterm Exams (4 total; lowest score dropped; 100 pts each)	see below	see below
Final Exam	see below	see below
Exams <i>Version 1</i>	Midterm Exams (30% total)	300
	Final Exam (cumulative, 20%)	200
Exams <i>Version 2</i>	Midterm Exams (18% total)	180
	Final Exam (cumulative, 32%)	320

Grading scale

A+	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	F
≥ 970	930-969	900-929	870-899	830-869	800-829	770-799	730-769	700-729	670-699	630-669	600-629	≤ 599

Posting of Grades Scores for assignments and exams will be posted on Canvas. Plan to regularly check your grades and notify us right away of any errors and/or omissions.

Course materials and technology

The textbook for this class is available for free online! www.openstax.org/details/books/biology-2e

Your book is available in web view and PDF for free. You can also choose to purchase on iBooks or get a print version from OpenStax on Amazon.com.

You may use whichever formats you'd like. Web view is recommended -- the responsive design works seamlessly on any device. If you buy on Amazon, make sure you use the link on your book page on openstax.org so you get the official OpenStax print version. Simple printouts sold by third parties on Amazon are not verifiable and not as high-quality.

For several labs, we will use the SimUText virtual lab software from SimBio. The total cost will be \$24 per student to purchase this and you will have access for the year.

For technical requirements and knowledge: <https://blogs.uoregon.edu/online/uo-resources/>

General technology support: <https://service.uoregon.edu/TDClient/2030/Portal/Home/>

Canvas and/or Panopto support: <https://service.uoregon.edu/TDClient/2030/Portal/Requests/ServiceDet?ID=38635>

Zoom support: <https://service.uoregon.edu/TDClient/2030/Portal/KB/ArticleDet?ID=101392>

Class schedule (lecture and lab topics)

** Schedule subject to change with the discretion of the instructors. Any changes will be announced with as much advance notice as possible.*

Week	Major topic(s)	Laboratory Topic
1	Macromolecules carbohydrates, lipids, proteins, nucleic acids <i>case study: Gaucher Disease</i>	Macromolecules and DNA sorting 1 Problem solving 1
2	Cell structure & function types of cells, organelles, cellular trafficking <i>case study: Gaucher Disease</i>	Discovering Cells Problem solving 2
3	Energy: enzymes, ATP, cellular respiration, fermentation <i>case study: Kristine (Mitochondrial disease)</i>	Cellular Respiration Explored (SimUText) Problem solving 3
4	Energy: photosynthesis	Modeling Photosynthesis Problem solving 4
5	Cell cycle: DNA structure & replication; mitosis <i>case study: Cancer</i>	DNA Explored (SimUText) Problem solving 5
6	Protein synthesis: central dogma, transcription, RNA processing, translation <i>case study: Cystic fibrosis</i>	Cell cycle in Onion Roots Mitosis Explored (SimUText) Problem solving 6
7	Sources of variation: mutation, meiosis <i>case study: Down Syndrome</i>	Transcription and Translation Explored (SimUText) Problem solving 7
8	Inheritance: single gene, two genes (unlinked & linked)	Analyzing the human beta-globin gene sequence Problem solving 8
9	Genetic analysis: recombination, genetic mapping	Meiosis Explored (SimUText) Problem solving 9
10	Human disease and genetics: inheritance patterns, gene therapy, COVID-19 testing and vaccination <i>case study: Sickle Cell Disease, COVID-19</i>	DNA Sorting 2 Problem solving 10
Final Exam on Monday 3/15(cumulative); online		

Course Policies

Academic integrity

All students will be expected to adhere to the University's guidelines on academic integrity as outlined in the Student Conduct Code: <https://policies.uoregon.edu/vol-3-administration-student-affairs/ch-1-conduct/student-conduct-code>. As detailed in the policy, academic misconduct means the violation of university policy involving academic integrity. This includes cheating ("any act of deception by which a student misrepresents or misleadingly demonstrates that the student has mastered information on an academic exercise that the student has not mastered"), and plagiarism ("using the ideas or writings of another as one's own.") The instructor has a zero tolerance policy for academic dishonesty. All persons involved in academic dishonesty will be disciplined in accordance with University regulations and procedures, which may include receiving a failing grade for this course. Finally, you do not have permission to post any course related material on outside private or public websites (i.e. coursehero, chegg, groupme, etc.). Violations of this request will be considered a form of academic misconduct.

Honor Code

In these trying times it is especially important that we maintain the integrity of university education. Presumably we all value this or we would not be participating. In our remote course, I will ask you to certify that your tests and the final exam are your own work. The tests and final will be timed and Canvas will automatically vary the questions students receive. We will adjust times to support students with accommodations through the Accessible Education Center. If a technological glitch disrupts your exam, don't panic. Take a photo to document the error message you receive and then email your instructor and at least one other staff member so that we can do our best to get back to you as quickly as possible.

Class Courtesy

Class rosters are provided to the instructors with your legal name. We will gladly honor your request to address you by an alternate name or gender pronoun. Please advise us of this preference early in the term so we may address you properly.

Open inquiry, freedom of expression, and respect for difference are fundamental to a comprehensive and dynamic education. We are committed to upholding these ideals by encouraging the exploration, engagement, and expression of divergent perspectives and diverse identities. Classroom courtesy and sensitivity are especially important with respect to individuals and topics dealing with differences of race, culture, religion, politics, sexual orientation, gender, gender variance, and nationalities. Our remote classroom is a learning environment, and as such should be a safe, inclusive and respectful place. Being respectful also includes using preferred pronouns for your classmates. Disrespecting fellow students as well as combative approaches, tones and/or actions are not acceptable. Please make the instructors aware if there are classroom dynamics that impede your (or someone else's) full engagement in our class.

For more guidelines for participating in our remote course please carefully read "[guidelines for participating in our remote course](#)" on Canvas.

Campus resources to support your learning & well-being

Tutoring and Academic Engagement Center

Remote tutoring support: (<https://engage.uoregon.edu/services/>)

Remote learning resources (<https://engage.uoregon.edu/remote-learning-resources/>)

Counseling Center Call anytime to speak with a therapist who can provide support and connect you with resources. Located on the 2nd Floor of the Health Center (541) 346-3227

Accessible Education Center The University of Oregon is working to create inclusive learning environments. The instructor believes strongly in creating inclusive learning environments. If there are aspects of the instruction or design of this course that result in barriers to your participation, please notify us as soon as possible. You are also encouraged to contact the Accessible Education Center. If you are not a student with a documented disability, but you would like for us to know about class issues that will impact your ability to learn, we encourage you to come visit during office hours so that we can strategize how you can get the most out of this course. (541) 346-1155, uoaec@uoregon.edu

Center for Multicultural Academic Excellence (CMAE) mission is to promote student retention and persistence for historically underrepresented and underserved populations. We develop and implement programs and services that support retention, academic excellence, and success at the UO and beyond. We reaffirm our commitment to all students, including undocumented and tuition equity students. (541) 346-3479, <https://inclusion.uoregon.edu/center-multicultural-academic-excellence-cmae>

Duck Rides provides essential nighttime transportation services for UO students and employees for Fall Term 2020. This is a new partnership between UO's existing student ride services and will replace these services as an adjustment to COVID-19. Duck Rides is committed to providing friendly and necessary transportation to students in a safe manner.

Discrimination and Harassment

Prohibited Discrimination and Harassment

Any student who has experienced sexual assault, relationship violence, sex or gender-based bullying, stalking, and/or sexual harassment may seek resources and help at safe.uoregon.edu. To get help by phone, a student can also call either the UO's 24-hour hotline at 541-346-7244 [SAFE], or the non-confidential Title IX Coordinator at 541-346-8136. From the SAFE website, students may also connect to Callisto, a confidential, third-party reporting site that is not a part of the university.

Students experiencing any other form of prohibited discrimination or harassment can find information at aaeo.uoregon.edu or contact the non-confidential AAEO office at 541-346-3123 or the Dean of Students Office at 541-346-3216 for help. As UO policy has different reporting requirements based on the nature of the reported harassment or discrimination, additional information about reporting requirements for discrimination or harassment unrelated to sexual assault, relationship violence, sex or gender based bullying, stalking, and/or sexual harassment is available at [Discrimination & Harassment](#).

The instructor of this class is a Student-Directed Employee. As such, **if you disclose to me, I will respond to you with respect and kindness. I will listen to you, and will be sensitive to your needs and desires. I will not judge you. I will support you.** As part of that support, I will direct students who disclose sexual harassment or sexual violence to resources that can help. **I will only report the information shared to the university administration when you as the student requests that the information be reported** (unless someone is in imminent risk of serious harm or is a minor). Please note the difference between 'privacy' and 'confidentiality.' As a Student-Directed Employee I can offer privacy because I am not required to report certain

information to the university. However, I cannot be bound by confidentiality in the same way that a counselor or attorney is. Confidential resources such as these means that information shared is protected by federal and state laws. Any information that I as a student-directed employee receive may still be accessed by university or court proceedings. This means, for example, that I could still be called as a witness or required to turn over any related documents or notes that I keep.

Please note also that I am required to report all other forms of prohibited discrimination or harassment to the university administration. Specific details about confidentiality of information and reporting obligations of employees can be found at titleix.uoregon.edu.

Mandatory Reporting of Child Abuse

UO employees, including faculty, staff, and GEs, are mandatory reporters of child abuse. Child abuse pertains to individuals who are under the age of 18. This statement is to advise you that your disclosure of information about child abuse to the instructor may trigger my duty to report that information to the designated authorities. Please refer to the following links for detailed information about mandatory reporting: [Mandatory Reporting of Child Abuse and Neglect](#).