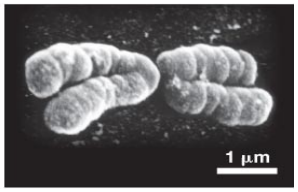


BI 211 General Biology I: Cells Fall 2021

Instructors: Dr. Nicola Barber & Dr. Jana Prikryl

Learning Outcomes for BI 211 General Biology I: Cells

In this first course of the general biology sequence, we study biological processes from a molecular and cellular prospective. 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).

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 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.
- To become familiar with the use of science relevant search engines, and learn to identify primary work and understand the merits of the peer review process; to develop the ability to think critically about information, evaluate the validity of arguments, and weigh the merits of disparate scientific conclusions.

Course Prerequisites

Students must have successfully completed one college level chemistry class. If you are going to take only one chemistry course, we recommend that you take CH111, CH113 or CH114 rather than the general chemistry sequence. A year of general chemistry (CH 221-223), with lab, is required to complete a biology major. **The prerequisites for BI 211-214 are strictly enforced.**

Course Materials

You will need to purchase an iClicker *(Personal Response Systems)* and Course Packet for this class. Both are available at the UO Duckstore. All other resources will be available online through the course Canvas site.

Course Format

Important notice:

Posting course material including videos, lecture notes, problems, and solutions, on any platform that is not officially affiliated with the course is prohibited and will be treated as academic misconduct and reported to the Dean of Students Office. If you have questions about what is appropriate and what is not, please ask, ignorance will not be an acceptable defense.

In-person components

Lectures:

Monday, Wednesday and Friday, 10:00-10:50 (Nicola's class) & 11:00-11:50 (Jana's class) in 123 Pacific

You must attend the lecture for which you are registered. Some lectures will include activities that help you actively engage with the material. These activities will often be done collaboratively with a small group of students discussing the problem together for a few minutes before discussing it as a whole class. Your active participation will help you to understand the material and better prepare you for exams.

Your application of two principles will help you learn biology. First**, learning is done by the learner**. In other words, the structure of the class helps identify the important concepts and skills, organizes the material, provides practice, and encourages learning, but only students themselves, by putting in effort on a continuing (and not binge) fashion, can actually do the learning. Second, **the speaker is doing the learning.** In a lecture, it is the lecturer who, during preparation, is learning the material, not necessarily the people listening. On the other hand, when explaining one's answer on an iClicker question, the person who is doing the talking is doing the learning about the material. When possible in class, you will be encouraged to speak with other students about the material (and are encouraged to do so outside of class as much as possible) as a strategy for reinforcing the concepts you are expected to learn.

iClickers during lecture (Personal Response Systems)

iClickers will be used in almost every class to encourage active participation and to provide feedback to instructors and students. Each student should purchase a clicker for use in this class before the first day of classes. You must register your clicker on the course Canvas site. Questions during lecture that require clickers will be multiple choice. Most clicker question will be graded based on participation and not on correct answer. If a clicker question will be graded on correct answer, we will let you know. Total percent for the clicker portion of your grade will be based on 85% of the total possible iClicker points: your clicker grade = (total points earned)/(85% of total points possible). iClicker problems are not simply a means of taking attendance. They force students to grapple in real time with the material under discussion. Furthermore, they provide an opportunity to exercise the principle that the speaker is the one doing the learning because first, when you answer the iClicker problem you are 'speaking', and second, you may be asked to verbally explain your answer to either the class or to a student who selected a different answer than yours.

Labs:

Wednesdays and Thursdays in Huestis (HUE) 129 (Nicola's class) and 111 (Jana's class)

Attendance is mandatory (unless you are sick or asked to quarantine). We consider the 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. The course packet, available for purchase at the UO Duckstore, contains the lab handouts for each week. Lab handouts will be turned in at the end of each lab or the beginning of lab the following week (due dates announced each week in lab). Late lab reports will not be accepted. Each lab will be graded on a 15-point scale. Part of this grade will be based on participation in lab. Most labs cannot be made up in-person because they involve special material or equipment. That said**, if you are sick, please stay home and take care of yourself; the next section discusses makeup work in this situation.**

If you must miss a lab or lecture:

Please fill out an absence plan (found in the resource page on canvas), contact your group members to coordinate your part in completing any groupwork, and complete the lab/lecture makeup assignment (also in the resource page). Lab makeup work is intended for students who are sick or required to quarantine, and should not be considered as a suitable alternative to lab for avoidable absences.

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

Other Graded Work

Due each Monday on Canvas
Weekly individual review quizzes and group problem sets:
The individually completed quizzes will test basic knowledge of course content. Most of the questions will test recall of information instead of synthesis and application. These quizzes are available on canvas and will be graded by canvas. Practice quizzes (which use the same question banks as the graded quizzes) are also available in the review materials on canvas.

While it is important to do well on the quizzes, they are only part of what is needed to be successful in the class; the group problem sets are arguably even more important because they will test higher order skills like application, modeling, and synthesis of the content learned in class. These problem sets will be complete with your group, established in lab. Only one set will be turned in per group. Your problem set grade will be based on one problem selected from each set to be graded by your GE. You will not know in advance which problem the GE will grade. Practice problem sets are available in the review material on canvas. Exams will have a short section that mirrors the quiz questions and a longer section that mirrors the problem set questions. Note: Week 10 quiz and problem set will be due on Friday of week 10 (and not the following Monday).

Due each Wednesday on Canvas
Big Picture assignments: The purpose of these weekly assignments are to build metacognitive skills and relate what we're learning to

Due each Friday on canvas
Discussion boards: The purpose of the online discussion boards are to build foundational content knowledge, practice learning skills and make connections across the sciences. You will be asked to post a reflection and respond to others in your lab.

Extra Credit Surveys:
These surveys are to introduce yourselves to the instructors, gather midterm and end-of-course feedback, and evaluate (and self-evaluate) problem solving groups.

Exams:
This course has three exams (two 50-minute, in-class midterms and a 2-hour final). All exams will include a smaller component that mirrors the individual quizzes, and a larger component that mirrors the group problem sets. 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 only acceptable reasons to miss an exam are sickness, mandatory quarantine, or an unforeseen emergency; in these cases, you must contact your instructor as soon as possible to discuss your absence.** Exams are graded by GEs under the supervision of faculty. To promote consistency, a single person grades each question. Everyone is required to take the final exam**.** This is a combined final exam for both sections of 211 and the exam will be cumulative. Note the dates of the exams and don't plan to be gone on these days.

The exam portion of your grade will be calculated 2 ways and we will automatically use whatever way gives you the highest total. 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.

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 use the following guidelines: 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. 3) You must submit also your original exam, explaining specifically why your answer merits a higher score. Keep in mind that we reserve the right to regrade the entire exam and a regrade may result in a higher, lower, or unchanged score.

Practice resources

Practice Review Quizzes

Each week you will have access to practice review quizzes that draw questions from the same question bank as the graded review quiz due each Monday. You can take these quizzes multiple times if you like. We strongly recommend that you make use of these quizzes to review your recall of class content and to ensure that you do well on the graded quizzes. Nicola's class will also use these practice quizzes to make up lecture absences.

Practice Problem Sets

There will be several practice problem sets that will be posted on Canvas during the term. It is very important that you work on these during each week. We will help you to understand how to solve these problems in the help sessions. The practice problems are very similar to the types of questions you will see on the exams (many of the problems are from past exams). They are designed to help you master the material needed to do well on exams.

Videos

Both Nicola and Jana have made course videos available in the review materials on Canvas. These videos where created for the remote/online version of the course and are a great tool for reviewing content and making up lecture absences. Jana's class will use the embedded questions in Jana's videos to make up lecture absences.

Reading resource

This class uses the Free online Openstax Biology 2e text. Links to the readings relevant to each weeks content can be found in the review materials on Canvas. Readings include background material useful to prepare you for lecture and to study for exams. We don't expect you to memorize all details in this material. A good strategy is to skim over the entire chapter first, concentrating on the major concepts, then to read more carefully the assigned pages, focusing on the ideas discussed in lecture and lab.

Evaluation

Component		Percent	Points (1000 total)
Lab activities (8 total, 15 pts each) (due in lab or following lab)		12%	120
Participation (clickers or online lecture questions)		5%	50
Big Picture assignments		5%	50
Group problem sets		15%	150
Discussion boards		5%	50
Canvas Review Quizzes (weekly, cumulative, 20 pts each)		20%	200
Exams *Version 1*	Two Midterm Exams (95 pts each, 19% total)	38%	190
	Final Exam (cumulative, 19%)		190
Exams *Version 2*	Two Midterm Exams (45 pts each, 9% total)	38%	90
	Final Exam (cumulative, 29%)		290

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. Note: the final grade calculated by Canvas may not give an accurate reflection of your grade and the evaluation table (including alternative exam weighting scheme) above should be used for more accurate grade calculation.

BI 211 Calander F21: assignment dates are fixed, content discussion dates might need to be adjusted

PS: Problem set (group) **Q**: Review Quiz (individual) **BP**: Big Picture (Individual) **D**: Discussion board (individual)

October	Monday	Tuesday	Wednesday	Thursday	Friday
Week 1	**27** Macromolecules Carbohydrates	**28**	**29** BP 1: Learning BI Lipids & proteins Week 1 lab: Discovering Molecules	**30**	**1** D1 Proteins Nucleic acids
Week 2	**4** PS 1 & Q 1 Cell structure function I	**5**	**6** BP 2: Groupwork Cell structure funct II Week 2 lab: Discovering Cells	**7**	**8** D2 Energy & ATP
Week 3	**11** PS 2 & Q 2 Harvesting Chemical Energy I	**12**	**13** BP 3: cross-cutting concepts Har Chem Energy II Week 3 lab: Modeling Cellular Respiration	**14**	**15** D3 Harvesting Chemical Energy III
Week 4	**18** PS 3 & Q 3 Photosynthesis I	**19**	**20** BP 4 Class support Photosynthesis II Week 4 lab: Modeling Photosynthesis	**21**	**22** D4 Exam 1
Week 5	**25** PS 4 & Q 4 Cell Cycle: Intro DNA structure	**26**	**27** BP 5: Test reflection Cell Cycle: replication Week 5 lab: DNA Replication & midterm review	**28**	**29** D5 Cell Cycle: Mitosis

November	Monday	Tuesday	Wednesday	Thursday	Friday
Week 6	**1** PS 5 & Q 5 Protein Synthesis: Intro & transcription	**2**	**3** BP 6 Information Lit Prot Synth: RNA processing Week 6 lab: Cell cycle and Modeling Mitosis	**4**	**5** D6 Prot Synth: translation
Week 7	**8** PS 6 & Q 6 Prot Synth: mutation	**9**	**10** BP 7: Interest reflection Meiosis I Week 7: Veterans Day, no lab	**11** Vets Day	**12** D7 Meiosis II: errors in meiosis
Week 8	**15** PS 7 & Q 7 Genetics: Inheritance I	**16**	**17** BP 8 career Inheritance II Week 8 lab: Genetics, Meiosis, Protein synth	**18**	**19** D8 Exam 2
Week 9	**22** PS 8 & Q 8 Genetics: Recombination I	**23**	**24** BP 9: Finishing strong D9 Recombination II Week 9: Thanksgiving, no lab	**25** Thanksgiving	**26** Thanksgiving

December	Monday	Tuesday	Wednesday	Thursday	Friday
Week 10	**29** PS 9 & Q 9 Human Genetics I	**30**	**1** BP 10 cross-cutting concepts Human Genetics II Week 10 lab: Virtual Genetics Lab	**2**	**3** PS 10 & Q 10 & D10 Wrap-up
	6 Finals week stay tuned for info about combined final				

Class Courtesy

Please arrive in class on time. Late arrivals distract the instructor and the other students. Please turn off cell phones during the class meeting times. Use your laptop only for class activities. Do not leave class early unless you have cleared it with the instructor in advance. Ask questions if you did not hear or understand something.

Class rosters are provided to the instructor with the student's legal name. I will gladly honor your request to address you by an alternate name or gender pronoun. Please advise me of this preference early in the quarter (or before) so that I 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 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 me aware if there are classroom dynamics that impede your (or someone else's) full engagement.

Academic Disruption
Academic Disruption due to Campus Emergency

In the event of a campus emergency that disrupts academic activities, course requirements, deadlines, and grading percentages are subject to change. Information about changes in this course will be communicated as soon as possible by email, and on Canvas. If we are not able to meet face-to-face, students should immediately log onto Canvas and read any announcements and/or access alternative assignments. Students are also expected to continue coursework as outlined in this syllabus or other instructions on Canvas.

In the event that the instructor of this course has to quarantine, this course may be taught online during that time."

COVID Containment Plan for Classes

As the University of Oregon returns to in-person instruction, the key to keeping our community healthy and safe involves **prevention**, **containment**, and **support**. Here is information critical to how the UO is responding to COVID-19.

- **Prevention**: To prevent or reduce the spread of COVID-19 in classrooms and on campus, all students and employees:
    1. Must to be comply with vaccination policy
    2. Must wear face coverings in all indoor spaces on UO campus
    3. Complete weekly testing if not fully vaccinated or exempted
    4. Wash hands frequently and practice social distancing when possible
    5. Complete daily self-checks
    6. Stay home/do not come to campus if feeling symptomatic
    7. Complete the UO COVID-19 case and contact reporting form if you test positive or have been in close contact with a confirmed or presumptive case.
- **Containment:** If a student in class tests positive for COVID-19, all relevant classes will be notified via an email by the Corona Corps Care Team with instructions for students and staff based on their vaccination status. Specifically:
    8. **Vaccinated and Asymptomatic students:** Quarantine not required, but daily self-monitoring before coming on campus is advised; sign up for testing through MAP 3-5 days after exposure if advised you are a contact."
    9. **Unvaccinated or partially vaccinated students:** 14-day quarantine advised – do not come to class – and sign up for testing 3-5 days after notification through MAP, if asymptomatic, or through University Health Services (541-346-2770) or your primary care provider, if symptomatic.

10. **Symptomatic students:** stay home (do not come to class/campus), complete the online case and contact form, and contact University Health Services (541-346-2770) or your primary care provide to arrange for immediate COVID-19 testing.

Students identified as a **close contacts** of a positive case will be contacted by the Corona Corps Care Team (541-346-2292).

- **Support**: The following resources are available to you as a student.
  - University Health Services or call (541) 346-2770
  - University Counseling Center or call (541) 346-3277 or (541) 346-3227 (after hrs.)
  - MAP Covid-19 Testing
  - Corona Corps or call (541) 346-2292
  - Academic Advising or call (541) 346-3211
  - Dean of Students or call (541)-346-3216

Good Classroom Citizenship

- Wear your **mask** and make sure it fits you well
- **Stay home** if you're sick
- **Get to know your neighbors** in class, and let them know if you test positive
- **Get tested** regularly
- Watch for **signs and symptoms** with the daily symptom self-check
- **Wash your hands** frequently or use hand sanitizer

Complete the UO COVID-19 **case and contact reporting form** if you test positive or are a close contact of someone who tests positive."

Accessible Education

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 in 360 Oregon Hall at 541-346-1155 or uoaec@uoregon.edu.. 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.

Academic Misconduct -

The instructor has a zero tolerance policy for academic misconduct. The University Student Conduct Code (available at conduct.uoregon.edu) defines academic misconduct. Students are prohibited from committing or attempting to commit any act that constitutes academic misconduct. By way of example, students should not give or receive (or attempt to give or receive) unauthorized help on assignments or examinations without express permission from the instructor. **Posting course material including videos, lecture notes, problems, and solutions, on any platform that is not officially affiliated with the course is prohibited and will be treated as academic misconduct and reported to the Dean of Students Office.** Students should properly acknowledge and document all sources of information (e.g. quotations, paraphrases, ideas) and use only the sources and resources authorized by the instructor. If there is any question about whether an act constitutes academic misconduct, it is the students 'obligation to clarify the question with the instructor before committing or attempting to commit the act. Additional information about a common form of academic misconduct, plagiarism, is available at https://researchguides.uoregon.edu/citing-plagiarism.

Inclement Weather

It is generally expected that class will meet unless the University is officially closed for inclement weather. If it becomes necessary to cancel class while the University remains open, this will be announced on Canvas and by email. Updates on inclement weather and closure are also communicated in other ways described here: https://hr.uoregon.edu/about-hr/campus-notifications/inclement-weather/inclement-weather-immediate-updates

Reporting Obligations

I am 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.

For information about my reporting obligations as an employee, please see Employee Reporting Obligations on the Office of Investigations and Civil Rights Compliance (OICRC) website. Students experiencing any form of prohibited discrimination or harassment, including sex or gender-based violence, may seek information and resources at safe.uoregon.edu, respect.uoregon.edu, or investigations.uoregon.edu or contact the non-confidential Title IX office/Office of Civil Rights Compliance (541-346-3123), or Dean of Students offices (541-346-3216), or call the 24-7 hotline 541-346-SAFE for help. I am also a mandatory reporter of child abuse. Please find more information at Mandatory Reporting of Child Abuse and Neglect.

Mental Health and Wellness

Life at college can be very complicated. Students often feel overwhelmed or stressed, experience anxiety or depression, struggle with relationships, or just need help navigating challenges in their life. If you're facing such challenges, you don't need to handle them on your own--there's help and support on campus.

As your instructor if I believe you may need additional support, I will express my concerns, the reasons for them, and refer you to resources that might be helpful. It is not my intention to know the details of what might be bothering you, but simply to let you know I care and that help is available. Getting help is a courageous thing to do—for yourself and those you care about.

University Health Services help students cope with difficult emotions and life stressors. If you need general resources on coping with stress or want to talk with another student who has been in the same place as you, visit the Duck Nest (located in the EMU on the ground floor) and get help from one of the specially trained Peer Wellness Advocates. Find out more at health.uoregon.edu/ducknest.

University Counseling Services (UCS) has a team of dedicated staff members to support you with your concerns, many of whom can provide identity-based support. All clinical services are free and confidential. Find out more at counseling.uoregon.edu or by calling 541-346-3227 (anytime UCS is closed, the After-Hours Support and Crisis Line is available by calling this same number)."

Basic Needs

Any student who has difficulty affording groceries or accessing sufficient food to eat every day, or who lacks a safe and stable place to live and believes this may affect their performance in the course is urged to contact the Dean of Students Office (346-3216, 164 Oregon Hall) for support.

This UO webpage includes resources for food, housing, healthcare, childcare, transportation, technology, finances, and legal support: https://blogs.uoregon.edu/basicneeds/food/

Accommodation for Religious Observances

The university makes reasonable accommodations, upon request, for students who are unable to attend a class for religious obligations or observance reasons, in accordance with the university discrimination policy which says "Any student who, because of religious beliefs, is unable to attend classes on a particular day shall be excused from attendance requirements and from any examination or other assignment on that day. The student shall make up the examination or other assignment missed because of the absence." To request accommodations for this course for religious observance, visit the Office of the Registrar's website (https://registrar.uoregon.edu/calendars/religious-observances) and complete and submit to the instructor the "Student Religious Accommodation Request" form prior to the end of the second week of the term.