Student 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 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).

The goals for BI 211 falls 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:
1. To describe the chemical structures and major functions of the four major types of large biological molecules that make up all living organisms.
2. To understand energy harvest pathways, including cellular respiration, fermentation and photosynthesis, and their relevance to human disease.
3. 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.
4. To understand and describe the major processes involved in gene expression, including the mechanisms of protein synthesis, comprising transcription and translation, and how they are controlled to determine phenotype.
5. To understand the basis of transmission genetics and solve problems using Mendel’s first and second laws; to analyze genetic pedigrees.

Skill-based goals:
1. To develop competency in the basic terminology and methodologies used in the biological sciences.
2. To learn the process of scientific inquiry and its applications.
3. To learn how to learn about biology.
4. To learn to communicate knowledge, ideas and reasoning clearly and effectively in oral and written forms.

Course Prerequisites

Students taking Bi 211 need a basic competency in math and chemistry, but should continue their studies in these areas if they want to be able to take Bi 214 and leave open the option of becoming biology majors. Students may also stop the sequence after completing Bi 213 and be eligible to take some, but not all upper division biology courses. Bi211 is the only prerequisite for Bi212 and Bi213. Bi214 requires completion of both Bi212 and a year of general chemistry. Completion of Bi 211-214 will allow students to take any 300-level biology course and major in biology.

Students must have taken Ch111 or higher. If you are going to take only one chemistry course, we recommend that you take Ch111, Ch113 or Ch114 rather than Ch221 or Ch 224. A year of general chemistry (Ch221-223
or Ch224-226), with lab, is required for biology majors. **The prerequisites for Bi211-214 will be strictly enforced.**

### Course Format

**Lectures** (Monday, Wednesday and Friday, 11:00-11:50 in 100 Willamette)

Some lectures will include activities that help you to 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.

One of the most effective ways to master the material for this class is to engage in conversations with other students, faculty, and staff. You will have the opportunity to do this in lecture through group-work, office hours, and problem-solving sessions. In addition, you might find it very helpful to form study groups with your peers in which you discuss class content and work through problems together.

**Labs** (Wednesdays and Thursdays in 111 Huestis)

The lab session is a small group of students that meets once a week. In lab, you will explore the diversity and complexities of macromolecules and cells, model major concepts in cellular biology, and perform scientific investigations to understand the mechanisms of inheritance. You may only attend the section for which you are registered. Attending other sections will only be allowed in extraordinary situations and with prior approval from your GE. **Attendance is mandatory; it is not possible to make up labs.**

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

**Practice Problem Sets** Practice problem sets will be made available on Canvas. While you are not required to turn these in, you are strongly encouraged to work on the practice problems. A good learning strategy is to work on a problem set by yourself for a while to answer or at least try to answer every question, and then compare your solutions with those of a friend who is in the class. Work through the logic of the problems together, particularly problems for which you have different answers. In addition, you can get help understanding how to solve these problems in the staff office hours, tutoring sessions, and problem-solving sessions. Practice problems are very similar to the types of questions you will see on the exams; in fact, most practice problems are from previous exams. Practice problems are designed to help you master the material needed to successfully solve the graded problem sets.

**Pre/Post-lecture Quizzes** There will be 26 short Canvas quizzes worth 5 pts each that will be based on the previous lecture and the next lecture coming up (from readings). On some Wednesdays there will also be some pre-lab questions from the pre-lab handout that will be posted on Canvas. We will drop the two lowest quizzes. The quizzes will be posted on Canvas within an hour after each lecture. The due dates of the quizzes are shown on the “Lecture and Lab Schedule” later in this syllabus. All quizzes are due by 10:30AM on their due dates (see syllabus). Solutions will be made available shortly after lecture. A good strategy would be to work on the quizzes as soon as possible after each lecture while that material is fresh in your mind. While we are happy to help you in help sessions to learn the material needed to take the quizzes, we will not give you the answers or verify that you got them right. We recommend that your work on the quizzes with other students. You can even do this in the help sessions. But it is considered academic dishonesty if you copy another students answers. (See discussion about academic dishonesty later in this syllabus).

**Laboratory Activities** Lab handout reports will usually be turned in at the end of each lab period. Lab handouts can be found in the course packet that you are required to buy from the UO bookstore. Each lab will be graded on a 10-point scale. For some labs, part of the grade will be based on your active engagement in the lab. Most labs cannot be made up because they involve materials specially prepared and available for the lab periods. **Late lab reports will not be accepted.**
**iClickers (Personal Response Systems)** iClickers will be used in almost every class to encourage active participation and to provide feedback to instructors and students. In fact, many days will begin with a couple clicker questions. 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. If you’ve already registered your clicker this term, for another class, then you don’t need to register it again. Questions during lecture that require clickers will be multiple choice. Points will be earned two ways: (1) 2-point questions: 2 points will be awarded based on participation alone, not on whether the question is answered correctly; (2) 4-point questions: 4 points for the correct answer, 2 points for an incorrect answer. 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 ask 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 will have to verbally argue your answer to either the class or to a student who selected a different solution than yours.

**Exams** This course has three exams: two midterms and a final. All exams will use the same short answer format. The final exam is cumulative. Exams will cover material from all aspects of the course including lectures, labs, readings, quizzes and problem sets. 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. Exams cannot be made up. Exams are graded by GE's under the supervision of faculty. To promote consistency, a single person grades each question. Everyone is required to take the final exam, which is scheduled for **Monday of finals week from 10:15-12:15. No early or late exams will be given.** Note the dates of the final and other exams and don’t plan to be gone on these days.

**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 lab GE 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 will regrade the entire exam and a regrade may result in a higher, lower, or unchanged score.

**Course Materials**

**Textbook** The text, Biological Science by S. Freeman, 5th or 6th edition, will be used as a general reference throughout the first three quarters of General Biology. 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. Copies of both editions of the textbook are on reserve in the Science Library.

**Course Packet** This packet, available at the Duck Store, contains most of the lab handouts you will need during the quarter. Labs not included in the course packet will be posted to Canvas and hardcopies will be supplied in lab.

**iClickers** Each student will need to purchase a clicker (available at the Duck Store). You must register your clicker (see link available on Canvas for clicker registration).
### Schedule (may change)

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Quiz</th>
<th>Lectures and Exams</th>
<th>Lab/Discussion</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1/6</td>
<td>none</td>
<td>L1: Macromolecules: carbohydrates (case: Gaucher disease)</td>
<td>Lab 1: Discovering Molecules</td>
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<tr>
<td></td>
<td>1/8</td>
<td>Q1</td>
<td>L2: Macromolecules: lipids and proteins</td>
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<tr>
<td></td>
<td>1/10</td>
<td>Q2</td>
<td>L3: Macromolecules: proteins and nucleic acids</td>
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<tr>
<td>2</td>
<td>1/13</td>
<td>Q3</td>
<td>L4: Cell Structure &amp; Function I</td>
<td>Lab 2: Discovering Cells</td>
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<tr>
<td></td>
<td>1/15</td>
<td>Q4</td>
<td>L5: Cell Structure &amp; Function II</td>
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<tr>
<td></td>
<td>1/17</td>
<td>Q5</td>
<td>L6: Energy, ATP, Enzymes</td>
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<tr>
<td>3</td>
<td>1/20</td>
<td>none</td>
<td>No Class: Martin Luther King Day</td>
<td>Lab 3: Practice exam, review and exam taking preparation</td>
</tr>
<tr>
<td></td>
<td>1/22</td>
<td>Q6</td>
<td>L7: Harvesting Chemical Energy: glycolysis (case: Kristine)</td>
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<tr>
<td></td>
<td>1/24</td>
<td>Q7</td>
<td>L8: Harvesting Chemical Energy: fermentation, Krebs Cycle</td>
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<tr>
<td>4</td>
<td>1/27</td>
<td>Q8</td>
<td>L9: Harvesting Chemical Energy: oxidative phosphorylation</td>
<td>Lab 4: Modeling Cellular Respiration</td>
</tr>
<tr>
<td></td>
<td>1/29</td>
<td>Q9</td>
<td>L10: Harvesting Chemical Energy (case: Kristine)</td>
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<tr>
<td></td>
<td>1/31</td>
<td>Q10</td>
<td>L11: Photosynthesis: light reactions</td>
<td></td>
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<tr>
<td>5</td>
<td>2/3</td>
<td>none</td>
<td>Midterm Exam #1 on lectures 1-10 and labs 1-4</td>
<td>Lab 5: Modeling Photosynthesis</td>
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<tr>
<td></td>
<td>2/5</td>
<td>Q11</td>
<td>L12: Photosynthesis: Calvin Cycle</td>
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<td></td>
<td>2/7</td>
<td>Q12</td>
<td>L13: DNA Structure</td>
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<td>6</td>
<td>2/10</td>
<td>Q13</td>
<td>L14: Cell Cycle: DNA replication and mitosis</td>
<td>Lab 6: Cell Cycle/Intro to Drosophila genetics</td>
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<tr>
<td></td>
<td>2/12</td>
<td>Q14</td>
<td>L15: Cell Cycle: cancer (case: HER2 gene)</td>
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<tr>
<td></td>
<td>2/14</td>
<td>Q15</td>
<td>L16: Protein Synthesis (case: cystic fibrosis)</td>
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<tr>
<td>7</td>
<td>2/17</td>
<td>Q16</td>
<td>L17: Protein Synthesis: transcription, RNA processing</td>
<td>Lab 7: Protein Synthesis: Analyzing the Human Beta-Globin Gene Sequence</td>
</tr>
<tr>
<td></td>
<td>2/19</td>
<td>Q17</td>
<td>L18: Protein Synthesis: translation and mutations</td>
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<tr>
<td></td>
<td>2/21</td>
<td>Q18</td>
<td>L19: Meiosis &amp; Sexual Life Cycle</td>
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<tr>
<td>8</td>
<td>2/24</td>
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<td>Midterm Exam #2 on lectures 11-18 and labs 5-7</td>
<td>Lab 8: Modeling Meiosis and Drosophila Genetics</td>
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<tr>
<td></td>
<td>2/26</td>
<td>Q19</td>
<td>L20: Errors in Meiosis (case: Down syndrome)</td>
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<tr>
<td></td>
<td>2/28</td>
<td>Q20</td>
<td>L21: Genetics: Mendel’s Law of Segregation</td>
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<tr>
<td>9</td>
<td>3/2</td>
<td>Q21</td>
<td>L22: Genetics: Independent Assortment</td>
<td>Lab 9: Modeling Simple Genetic Traits</td>
</tr>
<tr>
<td></td>
<td>3/4</td>
<td>Q22</td>
<td>L23: Genetics: Recombination and Gene Mapping</td>
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<tr>
<td></td>
<td>3/6</td>
<td>Q23</td>
<td>L24: Genetic Basis of Sex (case: Maria)</td>
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<tr>
<td>10</td>
<td>3/09</td>
<td>Q24</td>
<td>L25: Sex-linked Traits and Pedigrees</td>
<td>Lab 10: Modeling Complex Genetic Traits</td>
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<tr>
<td></td>
<td>3/11</td>
<td>Q25</td>
<td>L26: Codominance and Multiple Alleles</td>
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<tr>
<td></td>
<td>3/13</td>
<td>Q26</td>
<td>L27: Complex Traits and Wrap-up (cases: BRCA and Leber)</td>
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<tr>
<td></td>
<td>3/16</td>
<td></td>
<td>Final Exam on entire course, Monday 10:15-12:15</td>
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Exams & quizzes are in **bold**  
Q = pre/post-lecture quiz; posted soon after previous lecture and due by 10:30 a.m.

### Evaluation

<table>
<thead>
<tr>
<th>Component</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lab Handouts (10 total, 1% each)</td>
<td>10%</td>
</tr>
<tr>
<td>Clicker (total points earned/85% of total possible)</td>
<td>5%</td>
</tr>
<tr>
<td>Quizzes: Pre/Post-Lecture &amp; Pre-lab (26 quizzes, drop two lowest, 0.5% each)</td>
<td>12%</td>
</tr>
</tbody>
</table>

**Exams Version 1**  
Two Midterm Exams (21% each, 42% total)  
Final Exam (cumulative, 31%)  
73%

**Exams Version 2**  
Two Midterm Exams (11% each, 22% total)  
Final Exam (cumulative, 51%)  
73%

<table>
<thead>
<tr>
<th>Grade</th>
<th>A+</th>
<th>A</th>
<th>A-</th>
<th>B+</th>
<th>B</th>
<th>B-</th>
<th>C+</th>
<th>C</th>
<th>C-</th>
<th>D+</th>
<th>D</th>
<th>D-</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Points</td>
<td>97.0 - 100</td>
<td>93.0 - 96.9</td>
<td>90.0 - 92.9</td>
<td>87.0 - 89.9</td>
<td>83.0 - 86.9</td>
<td>80.0 - 82.9</td>
<td>77.0 - 79.9</td>
<td>73.0 - 76.9</td>
<td>70.0 - 72.9</td>
<td>67.0 - 69.9</td>
<td>63.0 - 66.9</td>
<td>60.0 - 62.9</td>
<td>0 - 59.9</td>
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</table>
Course Study Aids

Help Sessions (instructor & GE office hours, BTU tutor sessions) There are several hours every day where you can get help with the material. The times will be posted on Canvas.

Class Encore study groups for Bi211 Do you enjoy studying with other people? Would you like to practice course concepts with additional help? Are you interested in learning strategies for academic success? If so, check out Class Encore, a Tutoring and Academic Engagement Center program that sets up small, structured study groups for challenging classes. The groups meet outside of class once a week for 50 minutes, weeks 2-10. Students gather to practice course concepts and study strategies with the assistance of a trained peer leader. Registration for Class Encore is FREE and open to ALL students enrolled in the class; each group is limited to the first 10-12 students who sign up. To register, visit https://classencore.uoregon.edu/, or ask one of the leaders for more information. Registration will be available during week 1.

Learning Biology This is a program that is only available for students that do not do well on the first midterm. The exact cutoff for qualifying will be announced in lecture on the Wednesday after the first midterm (Feb 3rd) and the Learning Biology sessions will be held during weeks 6-10. There will be two sessions: Wednesdays from 4-6 and Wednesdays from 6-8. Students that complete all 5 weeks of Learning Biology will be eligible to raise their 1st midterm grade based on how they do on the same material on the final exam. If you know from past experience with other science courses (for instance chemistry) that you struggle doing well on exams, then you should keep your schedule open for these times.

What are the goals of Learning Biology?

- To increase student understanding of biology, specifically the concepts covered in General Biology I: Cells.
- To provide support for students to develop effective learning strategies that can be applied in BI 211 and other college classes.
- To increase retention in the General Biology sequence. The hope is that students will continue to use the skills they develop in Learning Biology as they progress through the General Biology sequence, and other courses taken at the UO.

How will these goals be achieved?

- In-class activities (individual and small group) will help develop effective study/learning strategies and problem-solving skills (specific to BI 211 content), guided by a staff of experienced instructors.

Tutoring and Academic Engagement Center

For information about the following services, visit us in Sky Studio, 4th floor of Knight Library.

We can help!

Free Small-Group Tutoring
For consistent support throughout the term, groups of up to six students meet 2 hours per week. Check in with us to inquire about which courses are currently supported http://engage.uoregon.edu, 541-346-3226, Knight Library – 4th floor

Free Drop-in Tutoring in Sky studio
Help with math, writing, and language is available throughout the week on the 4th floor of the Knight Library.

Individual Tutoring
We maintain a tutor database for many UO courses. Check in with us to inquire about costs. 541-346-3226, Knight Library – 4th floor

Individual Meetings
Learning Specialists are available to discuss your specific concerns, suggest alternative approaches to studying, and offer resources to help you achieve your goals. Visit Sky Studio to schedule an appointment or call 541-346-3226.
<table>
<thead>
<tr>
<th>Lectures</th>
<th>Readings (Freeman 5th edition)</th>
</tr>
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</table>
| 1 & 2    | • Ch 1: read quickly to get an overview of the book and the overall structure of the field of biology. Pay particular attention to the sections on cells (p. 2-4), classification (p. 6-9), and science as a process (p. 9-14). It is highly recommended that you review basic chemistry principles in Ch 2.  
• Ch 5: read the entire chapter on carbohydrates  
• Ch 6: focus on pgs. 84-90 (types, structure of lipids); skim pgs. 91-93 to review diffusion and osmosis |
| 2 & 3    | • Ch 3: read the entire chapter on protein structure and function  
• Ch 4: read pgs. 57-64 for an introduction to nucleic acid structure and function |
| 4 & 5    | • Ch 29-33: skim over the chapters to answer questions about domains and Lab #2  
• Ch 7: read the entire chapter on cells; focus on characteristics of prokaryote and eukaryote cells (p. 107-110) and organelles (p. 110-127); skim the remainder of the chapter to gain a deeper understanding of cell dynamics  
• Ch 6: read about cell membranes on pgs. 88-90 |
| 6        | • Ch 8: read pgs. 137-144 to focus on chemical reactions and energy; for a basic understanding of ATP and redox reactions; read pgs. 144-150 to focus on enzymes, effects of temperature and pH on enzymes |
| 7, 8, 9, and 10 | • Most students will have to carefully read Ch 9 on cellular respiration several times. Read the entire chapter fairly quickly the first time to get the general ideas and vocabulary. Then read again more carefully the specific pages that are listed. You must gain a basic understanding of the following material but don’t need to memorize all of the chemicals. Pgs. 155-158 provide a nice overview of cellular respiration, pgs. 158-172 provide more detail of the processes of cellular respiration, and pgs. 172-173 discuss fermentation. |
| 11 & 12  | • Most students will have to carefully read Ch 10 on photosynthesis several times. Read the entire chapter fairly quickly the first time to get the general ideas and vocabulary. Then read again more carefully the specific pages that are listed. Pgs. 176-184 provide a nice overview of photosynthesis, pgs. 184-190 (light reactions) and pgs. 190-192 (Calvin Cycle) cover the details of photosynthesis.  
• The Big Picture: pgs. 198-199 provides a nice overview of energy concepts |
| 13       | • Ch 4: read pgs. 58-65 on DNA structure and function |
| 14 & 15  | • Ch 12: read pgs. 219-223 for an introduction to the cell cycle; pgs. 223-228 for details of mitosis; pgs 229-232 for control of the cell cycle; pgs. 232-234 for cancer and the cell cycle  
• Ch 15: read pgs. 284-301; focus on pgs. 289-295 (DNA synthesis) |
| 16, 17 & 18 | • Ch 16: read pgs. 304-312 for an introduction to genes, the central dogma, and the genetic code; pgs. 313-315 discuss mutations  
• Ch 17: read the entire chapter for the details of protein synthesis  
• Ch 4: read pgs. 65-68 for RNA structure and function |
<p>| 19 &amp; 20  | • Ch 13: read pgs. 237-246 for details of meiosis; pgs. 249-251 discuss mistakes in meiosis |
| 21 &amp; 22  | • Ch 14: read pgs. 256-267; pgs. 261-263 discuss Mendel’s 1st Law; pgs. 263-266 discuss Mendel’s 2nd Law; B8 discusses some simple rules of probability that are useful for understanding Mendelian genetics |
| 23       | • Ch 14: read pgs. 269-271; read Quantitative Methods 14.1 on pg. 274 for creating genetic maps |
| 24       | • Ch 14: read pgs. 267-269 to focus on sex chromosomes and sex-linked inheritance; pgs. 277-279 discuss pedigrees |
| 25 &amp; 26  | • Ch 14: read pgs. 271-272 to focus on incomplete dominance, codominance and multiple alleles |</p>
<table>
<thead>
<tr>
<th>Lectures</th>
<th>Readings (Freeman 6th edition)</th>
</tr>
</thead>
</table>
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• Ch 5: read the entire chapter on carbohydrates  
• Ch 6: focus on pgs. 119-123 (types, structure of lipids); skim pgs. 127-128 to review diffusion and osmosis |
| 2 & 3    | • Ch 3: read the entire chapter on protein structure and function  
• Ch 4: read pgs. 93-100 for an introduction to nucleic acid structure and function |
| 4 & 5    | • Ch 26-30: skim over the chapters to answer questions about domains and Lab #2  
• Ch 7: read the entire chapter on cells; focus on characteristics of prokaryote and eukaryote cells (p. 143-146) and organelles (p. 146-162); skim the remainder of the chapter to gain a deeper understanding of cell dynamics  
• Ch 6: read about cell membranes on pgs. 123-125 |
| 6        | • Ch 8: read pgs. 171-178 to focus on chemical reactions and energy; for a basic understanding of ATP and redox reactions; read pgs. 179-184 to focus on enzymes, effects of temperature and pH on enzymes |
| 7, 8, 9  | • Most students will have to carefully read Ch 9 on cellular respiration several times. Read the entire chapter fairly quickly the first time to get the general ideas and vocabulary. Then read again more carefully the specific pages that are listed. You must gain a basic understanding of the following material but don’t need to memorize all of the chemicals. Pgs. 190-193 provide a nice overview of cellular respiration, pgs. 193-206 provide more detail of the processes of cellular respiration, and pgs. 206-207 discuss fermentation. |
|          | • Most students will have to carefully read Ch 10 on photosynthesis several times. Read the entire chapter fairly quickly the first time to get the general ideas and vocabulary. Then read again more carefully the specific pages that are listed. Pgs. 211-218 provide a nice overview of photosynthesis, pgs. 218-223 (light reactions) and pgs. 223-226 (Calvin Cycle) cover the details of photosynthesis.  
• The Big Picture: pgs. 232-233 provides a nice overview of energy concepts |
| 11 & 12  | • Most students will have to carefully read Ch 10 on photosynthesis several times. Read the entire chapter fairly quickly the first time to get the general ideas and vocabulary. Then read again more carefully the specific pages that are listed. Pgs. 211-218 provide a nice overview of photosynthesis, pgs. 218-223 (light reactions) and pgs. 223-226 (Calvin Cycle) cover the details of photosynthesis.  
• The Big Picture: pgs. 232-233 provides a nice overview of energy concepts |
| 13       | • Ch 4: read pgs. 94-101 on DNA structure and function |
| 14 & 15  | • Ch 12: read pgs. 253-257 for an introduction to the cell cycle; pgs. 257-262 for details of mitosis; pgs 263-266 for control of the cell cycle; pgs. 266-268 for cancer and the cell cycle  
• Ch 15: read pgs. 316-332; focus on pgs. 320-326 (DNA synthesis) |
| 16, 17 & | • Ch 16: read pgs. 335-343 for an introduction to genes, the central dogma, and the genetic code; pgs. 343-345 discuss mutations  
• Ch 17: read the entire chapter for the details of protein synthesis  
• Ch 4: read pgs. 101-103 for RNA structure and function |
| 18       | • Ch 14: read pgs. 289-299; pgs. 292-296 discuss Mendel’s 1st Law; pgs. 296-299 discuss Mendel’s 2nd Law; Bioskill 4 discusses some simple rules of probability that are useful for understanding Mendelian genetics; pgs. 26-27 |
| 19 & 20  | • Ch 13: read pgs. 271-280 for details of meiosis; pgs. 283-284 discuss mistakes in meiosis |
| 21 & 22  | • Ch 14: read pgs. 300-302 to focus on sex chromosomes and sex-linked inheritance; pgs. 310-312 discuss pedigrees |
| 23       | • Ch 14: read pgs. 302-305; read Quantitative Methods 14.1 on pg. 305 for creating genetic maps |
| 24       | • Ch 14: read pgs. 306-307 to focus on incomplete dominance, codominance and multiple alleles |
How to Succeed in General Biology without Really Trying
(just kidding: you probably can only succeed by working hard)

Students often ask us how to do better in the class, especially on the exams. Usually we get these questions right before the final, when it really is too late to learn all of the material that we cover in 10 weeks. Below is a checklist of things you should be doing if you want to learn the material in general biology. There is no easy, magic way to learn this material. It requires constant attention throughout the quarter.

Check List

☐ Did I actively participate in every lecture?
We think that the lectures are important for learning the material in this course. Just reading the lecture slides does not substitute for attending lectures. If you don’t come to lecture, you shouldn’t expect to do well in the course. But simply attending the lectures isn’t enough. You need to be an active participant. By active, we mean that your mind needs to be actively working with the information as it is presented. If you are confused or have a question, please raise your hand. Most students find it useful to write notes to help to keep their minds on the material, but you shouldn’t try to write so much that you aren’t even able to think about the material. Remember, all of the slides shown on the screen are posted on Canvas so you don’t need to write down everything that is on the slide.

☐ Did I read the lecture slides on the day of every lecture and then compare those notes with my own notes and the readings?
You should understand everything that we put on the slides. If the slide is a figure from your text, then you should look up that figure and read the material about that figure to make sure you understand it completely. If you have a question then you should come to one of the office hours or peer tutor sessions. Waiting until right before the exams to look at these lecture notes is no substitute for looking over the notes right after hearing the lecture.

☐ Did I do all of the practice problems as the material was presented in lecture? After doing the problems did I attend help sessions to see how I did?
The practice problems that are posted on the course site mostly come from previous exams. They give you a good idea of your understanding of the material. They also help you to become more comfortable with solving these kinds of questions so you can perform better on the exams. Solving the problems on your own is probably the single most important thing you should do (besides coming to class) in order to be successful in this course. The problems are often not simply asking you to repeat facts that you have learned. They often ask you to apply the concepts to novel situations. That is what scientists do and we want you to do science in this course. Just like you can’t learn how to play a guitar by simply reading about it, you can’t learn to do science (e.g., solve problems) without practicing doing science (i.e. practicing solving problems). If you just get the answers from a classmate or staff person at help sessions without trying to solve them yourself, then you aren’t practicing.

☐ Did I read all of the assigned readings in an active manner?
The textbook can be dry at times, but it presents the material in a very clear and concise manner. Much of the material cannot be understood by reading it once. You should be active as you read the material: take notes, underline key points, redraw important figures on your
own. It’s amazing how many evaluations we get from students that say, “I had trouble doing well in this class/” and also say “I hardly read the text at all.” It is true that most of the material on the exams has been covered in the lectures. But most people need to study this material in several ways: listening in lectures, working on the concepts in labs AND reading about it.

- Did I actively participate in all of the labs?
  The labs have been designed to help you learn the concepts in this course. It is very easy to just go through the motions in lab and get full credit for the labs BUT then you are wasting your time and not taking advantage of a very powerful way to learn complex material: modeling. We have carefully designed the labs so that you work with the concepts in a very active way. It is basically the same concepts that you hear in lectures, and read about in the text, but most of us need to work with the material in a number of different forms. For many students, nothing works as well as modeling.

- Did I visit the GEs, BULAs (Biology Undergraduate Lab Assistants) and faculty during their office hours, tutoring sessions and/or problem-solving sessions?
  We don’t charge for this service. 😊 You really should take advantage of the many hours we offer every week and get individual attention.

- Did I compare my answers to the exam solutions and work on the material I missed?
  If you didn’t get it the first time, make sure you don’t miss the problems on the same concepts in subsequent exams. This is especially true of the quizzes. Check your answers after they are posted, and if you missed a question, work through it again to make sure you don’t the same mistake on future exams. We’ve even been known to repeat similar questions that students missed on earlier exams.

- Did I retake exam questions and resolve problem sets prior to the midterm and final?
  Even though you’ve already seen the solutions, it still is a good idea to download the unsolved problems and exam questions and work on solving them again when studying for the midterms and final.

- Did I try to make connections with the material to things I hear about and read about outside of class?
  The best students try to see the connections in other courses and parts of their lives. They are thinking about and processing the information even when they aren’t specifically working on readings or problem sets for the course. We love to hear about connections you are discovering outside of the assignments.
**Campus resources to support your learning**

**Tutoring and Academic Engagement Center** (https://engage.uoregon.edu/services/) Drop-in math and writing support in addition to tutoring, study skills support, and Class Encore. Located in the 4th Floor Knight Library (541) 346-3226, engage@uoregon.edu.

**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. Located on the 1st Floor of Oregon Hall (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. Located on the 1st Floor of Oregon Hall (541) 346-3479, cmae@uoregon.edu

The **UO Access Shuttle** is an on-campus ride service provided at no cost to students with conditions that limit mobility. More information and a sign-up form can be found on the parking & transportation department website: https://parking.uoregon.edu/content/access-shuttle.

**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 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](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.

**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 respect.uoregon.edu or 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.

**Reporting**

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.

Safe Ride
541-346-7433 ext 2 pages.uoregon.edu/saferide

Safe Ride is an assault prevention shuttle that works to provide free, inclusive, and accessible alternatives to traveling alone at night for UO students, faculty, and staff.

We are a schedule-ahead service and riders can (1) call once we open to schedule a ride with a dispatcher or (2) leave a voicemail on the day of their ride request. We do not call riders ahead of time to confirm due to capacity constraints, but riders are always welcome to call us to double-check that their ride was scheduled. We are a feminist, ‘for-the-students/by-the-students’ organization and operate out of the Women’s Center in EMU 12F.

Operating hours:
Spring term Sunday - Thursday | 7p - midnight Friday + Saturday | 7p - 2a
Summer term Sunday - Thursday | 9p - midnight Friday + Saturday | 9p - 2a
Fall/Winter term Sunday - Thursday | 6p - midnight Friday + Saturday | 6p - 2a

Policy and rules:
1. We are a schedule-ahead service, we do not call ahead, and we can only wait for riders for 5 minutes at their pick-up time and location.
2. We only give rides to groups of 3 or fewer to prioritize groups that are at higher risk.
3. We are a free service and do not accept tips.