Biology is a difficult subject to grasp for two reasons. First, it requires you to learn a whole new vocabulary about abstract ideas. Second, biology is really many different sciences dealing with everything from the invisible macromolecules to the mindboggling global biosphere. The focus of this course is on the bits and pieces of living organisms – namely cells, the molecules making up cells, and how cells respond to their environment. While learning about the itty bitty things of life might seem far removed from dealing with the warm and fuzzy creatures we all love, one cannot escape the fact that in many instances, small things matter greatly. Diseases and environmental adaptations more often than not depend on how molecules affect the ability of cells to function.

So how do you deal with a class full of new and rather esoteric information without going crazy? The road to the Home for the Biologically Insane is usually paved with flashcards and other tools of brute-force memorization. This also makes biology rather boring. Fortunately, you can make the discipline much more interesting and somewhat easier to learn by developing stories to explain why cells behave the way they do. The stories that we will discuss in class collectively illustrate a major theme of biology—that structure and function are intimately linked. This is true both at the ecosystem level and at the molecular level, so one of the important skills I hope you get out of this class is to become better at changing your frame of reference between different scales. Being able to slide back and forth in scale, linking molecular properties to biological function and linking biological solutions to molecular “problems” will make understanding cellular processes much easier.

Here are the major goals you should strive to accomplish in this course.

- Describe the molecular basis for cellular processes such as respiration, hormonal signaling, transport, gene expression, or immunological responses.
- Explain the relationship between chemical structure and biological function for each of the major classes of biomolecules.
- Apply the structure/function relationships to predict how normal cellular processes might respond to drugs or disease.
- Develop and apply tools of scientific inquiry through experimentation and literature research.

This last objective is obviously linked to your activities in the lab and the library. While we aren’t grooming you to win the Nobel Prize, we are expecting you to develop skills necessary for working competently in the lab. This includes relatively simple manipulations of equipment to obtain meaningful results. Perhaps most importantly, we are expecting you to develop skills that will enable you to interpret and communicate those results as well as justify why you have chosen to ask an experimental question in the first place.

Your Responsibilities

You’ve probably heard the phrase “take responsibility for your learning”. The simple translation of this is to come to class, do the assignments, and study for the exams. After being a teacher (and a student) for many years, however, I have come to interpret this phrase more broadly. As a student, your main responsibility is to develop your own models or explanations that help you remember details about the systems we study. This
means that you need to try and connect new information to things you already know and develop your own way to make sense of the concepts generally accepted as being meaningful to biologists.

One way to start building your own understanding of the course material is to ask lots of questions. As we study various systems, you will undoubtedly encounter concepts and relationships that don’t make sense. When you find this happening, it is your responsibility to come forward and ask for clarification. I guarantee that if you don’t understand something, many of your classmates aren’t getting it either. Help them out and ask the questions.

Perhaps the most important responsibility you have in this or any course you take is to find the material relevant to your own interests. A friend once told me that everything can be interesting; you just have to make it so. While I strive to make the class interesting, I can neither force you to learn nor make you interested in a specific topic. As you mature in your learning, I think you’ll discover that the things you find interesting are the things you learn best. Remember, you are in control of what you choose to learn.

**Seeking Academic Enlightenment**

At some point you will need some help with understanding the class material. Recognizing and applying relationships between concepts can be a slow and laborious process. My best advice is to work diligently in short intensive sessions—don’t wait until the day before the exam and try to bash through it. For what it is worth, here is my simple three step plan toward academic enlightenment.

1. Think with your pencil. Outline the lectures and the book, write out questions and answers, mark the parts you don’t understand, draw pictures about the parts you do. By forcing things out through your hands, you have to process or translate them in your brain. That is really all it takes to learn something.
2. Ask someone—a friend, someone you want to know better, your favorite science major, or as a last resort, you could ask that guy who yacks endlessly in front of the class every day. Formulating a question makes you think, and thinking is a good thing.
3. Play with the subject matter. Turn things around to seek new perspectives. Find ways to relate the new concepts to the stuff you already know. See if concepts you encounter can explain unanswered questions you might have. Remember that we always learn best when something is “fun”.

**Course Assignments and Grading Policies**

**Exams** – The 3 exams will be short answer/essay type questions designed to assess your conceptual understanding and application of biological principles. You can best prepare for exams by taking good notes and asking questions to help clarify the conceptual connections addressed in class. The assigned homework problems are intended to help you study, not necessarily model what you will find on the exams. I will not collect or grade homework, but you can use it to bring up questions in class.

**Taste Lab Report** – This lab explores the effect of an Indian herbal tea on your taste perception. You will treat yourself with this herb, quantitatively evaluate if it changes your taste perception, and then write a short report using the data to support what we claim has happened.

**Cell Culture Experiments** – Cell cultures are cultivated cells grown in a flask and are used to study cellular development or biochemistry. By using cells grown outside an organism, we avoid introducing experimental variables that we can’t control and is very useful strategy to measure the effect of drugs or toxins on cellular morphology or metabolism. There are two graded parts to this assignment which will be explained in class.

**PTC gene lab** – Genes determine certain characteristics, one of which is the ability to taste a bitter substance called phenylthiocarbamate (PTC). In this lab you will isolate your DNA, amplify it using PCR, and molecularly characterize yourself for a certain set of PTC genes.
Final grades will be determined on a straight percentage basis (the approximate distribution is below) which means there is no curve.

<table>
<thead>
<tr>
<th>Point distribution</th>
<th>Grade scale</th>
</tr>
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<tbody>
<tr>
<td>3 Exams 300</td>
<td>A 94-100% A+ 90-94%</td>
</tr>
<tr>
<td>Taste lab report 50</td>
<td>C+ 77-80% C 73-77%</td>
</tr>
<tr>
<td>Cell culture lab 50</td>
<td>B+ 87-90% C- 70-73%</td>
</tr>
<tr>
<td>PTC allele lab 50</td>
<td>B 83-87% D+ 65-70%</td>
</tr>
<tr>
<td>total 450 pts</td>
<td>B- 80-83% D 60-65%</td>
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**Academic Dishonesty**

Part of the professional expectations for all scholars is to explicitly acknowledge the ideas, observations, or data created by others. Failing to do so is a form of academic dishonesty, and academic dishonesty is an extreme form of disrespect towards your peers and mentors. In its most general definition, academic dishonesty involves passing the ideas or information of others as your own original work. Obvious examples of dishonesty include actions such as plagiarism (copying, paraphrasing, or stitching) or cheating on exams; however, there are other examples of academic dishonesty (and how to avoid them) that are outlined in your student handbook, The Compass.

Students misrepresenting their work in this course (i.e. plagiarizing or cheating) will automatically fail the assignment and depending on the circumstances may receive a failing grade for the course. Violations of the College’s policies on academic dishonesty are also referred to the Registrar and the Dean of the College and will be dealt with as described in the student handbook.

A word about plagiarism… Collaboration is a great way to learn, and I strongly encourage you to work with others to help you understand the concepts and practices we undertake in class. Unfortunately it is difficult to identify those thoughts and statements that are specifically yours when working collaboratively. Nevertheless, I will expect you explain what you know in your own words. Copying verbatim, paraphrasing, or simply creating a cooperatively written document simply shows that you don’t take much pride in your work and makes it hard to convince others you are a valuable colleague to work with. Remember that this is not just about “getting through the class”; this is about you developing as an individual.

**Other Course Policies**

**Meeting Times**
We will have a formal class session every day from 8:30-11 am and 1:00–3:00 pm. You are expected to be prepared for and attend all classes.

**Office Hours**
I have an open door policy and am happy to stop what I am doing to answer your questions (unless I am helping another student). I am generally either in my office (WestSci 215) or in my lab (WestSci 207). You may also contact me to schedule a more specific time.

**Due Dates**
Due to the short time frame of our block semesters, we will not accept late assignments. You may, however, arrange alternative deadlines for situations in which you have a college-sanctioned event (athletics, choir, band, etc.) that conflicts with the deadline or if you are facing some extenuating health circumstance. Any alternative deadline must be arranged prior to the original deadline, preferably at the time the assignment is given.

**Exams**
There are 3 short answer/essay type exams intended to gauge your knowledge of course content and how well you can apply it to solving a problem. Exams will be available only on
the day scheduled and **there will be no make-up exams if you happen to miss one.** See the class schedule for the dates.

**Attendance**

*You are required to attend both lecture and lab.* Although it is possible to never miss a class, there are times when certain extenuating circumstances (i.e. illness or family emergencies) arise. If you find yourself in this situation, it is your responsibility to notify me before the actual class meeting time that you will not be attending. Failure to notify me beforehand is considered an unexcused absence. **Each unexcused absence will result in a deduction of 10 pts from your final grade.**

In the event that you need a late withdrawal on the 15th day, your attendance record is one of the things that I consider in deciding if you have made a “determined effort” to participate in the class. In the interest of defining “determined effort” with respect to attendance, I find it unlikely that you would face extenuating circumstances more than twice during the block.

**Withdrawals**

College policy allows you to drop this class within the first three days of the block.

College policy also permits withdrawing from any course on the 15th day of the block but only if 1) you have met the course attendance policy; 2) that you have completed all assignments, labs, and exams due on or before the 15th day, and 3) that you have, “in the instructor’s opinion, made a determined effort to learn the material, complete the work, and participate in class”.

**Special Needs**

If you require academic adjustments because of a documented learning disability or health-related concern, **it is your responsibility to 1) document your needs with the Registrar, and 2) notify me within the first 3 days of the block.** Accommodating students with special needs includes things such as help in taking notes, extra time for exams, or supervised tutorial support—it does not include opportunities for extra credit, different grading schemes, or alternative assignments. If you suspect you might have a learning disability but have not been diagnosed, you should consult with the Registrar or the Director of Counseling.

**iStuff**

I will admit that I am starting to show my age on this one, but I am concerned about the social disruptions that are caused by the use of cell phones and other electronic devices. Classrooms are a social learning environment, and I ask that you respect this environment by not using various iStuff while you are in class. The exception is, of course, any device you are using to take notes or engage in the class materials.