

Bio 101 Principles of Biology - Course Syllabus

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Office hours: MW 9:00 – 9:50 am; T 12:30-1:20 pm; Th 10:30-11:20

Accessibility: Try to come see me during posted office hours. Outside of these posted hours, an open office door means that you are welcome to ask questions (though I might shoo you away if busy); otherwise please e-mail me for an appointment. I am happy to make appointments for odd hours, except for the night before an exam!

Textbook: Biological Science by Freeman, 5th edition; you may also use OpenStax online biology text (available free at <https://openstax.org/details/biology>)

Writing Guide: Writing Papers for the Biological Sciences by McMillan

Tutors: Tutors will be available in the times and locations announced in class and posted on Moodle.

Lab & Instructors: The lab for this course is held in Nobel 324. If you have questions or concerns specifically about lab, contact your lab instructor. If you need to change lab sections permanently, please contact Eric Elias at 933-7329 or by emailing celias@gac.edu.

Lab book: Bio 101 Principles of Biology Laboratory Manual

All texts are available at the BookMark (Campus Center) or through its website: <https://gustavus.edu/bookmark/>

The most important thing you can learn in class is how to learn, to reason, to assimilate information for yourself, to critically evaluate the information you encounter, and to understand how science is done. You can learn the facts, the content of biology, anywhere.

Course Description

This class is the first for majors in Biology, BMB, Nursing, Education or E.S. It is also appropriate for pre-health students. The course is *not* intended for non-majors intending to fulfill the NASP distribution requirements. The concepts introduced here form a broad foundation for understanding biology, which is the study of all life. Biology integrates genetics, evolution, ecology, chemistry, physiology, physics, math and cell biology, and you will begin to make connections among these disciplines. Our explorations will be organized into four large sections, each concluded with an exam:

- *The Structure of Life.* A review of macromolecules, cell structure & dynamics
- *Cellular Metabolism.* How cells harvest and transfer energy for growth
- *A Survey of Genetics.* Mendelian and molecular genetics in eukaryotes.
- *Species in Space and Time.* The evolution, ecological interactions and conservation of species.

Class Learning Outcomes

After this class, you will be able to:

- Demonstrate factual knowledge about the natural world, including the following:
 - Differentiate the structure and function of the basic macromolecules.
 - Describe the cellular organization and processes common to *all* living beings.
 - Understand the relationship between structure and function of molecules and cells.
 - Demonstrate how energy is acquired and transformed so all life can persist.
 - Explain reproduction and how genetic instructions encode molecules essential to life.
 - Illustrate how genetic information is passed on along generations.
 - Model how living organisms evolve; use data to make conclusions about evolution.
 - Identify how living things interact with each other and surrounding physical features.
- Use the scientific method to generate explanations based on data or known principles.
- Understand how biological principles are discovered, how theories are built from these principles, and how experimental results allow us to make additional predictions.
- Contextualize and analyze the philosophical implications of scientific concepts.
Engage in discussions about ethical and social impacts of scientific discoveries.

Class Resources

This course will be organized on Moodle (<http://moodle.gac.edu>). Log in with your Gustavus username and password. I will post my lectures there, as well as quizzes and other assignments. If you have trouble accessing Moodle in general, contact Gustavus Technology Services (GTS) helpline (x6111). If there's a problem with a particular file on Moodle, contact me.

Case Studies & Lecture

This course will use a series of case studies (listed on the Schedule) to help you apply what you've learned about a subject, or, in some cases, to introduce that subject. You will be assigned to a group that will be responsible for answering the study questions and understanding the content of the case study, and one person from the group will be responsible for writing (with the help and input from the rest of the group) a Case Summary Paper. With six cases over the semester, each person will get to be the Writer of a summary twice, and will contribute as a Helper four other times. It's up to you and your group which role you take and when. Case studies will typically have these assignments:

Case Summary (writer)	20 pts	Quiz	5 pts
Case Summary (helper)	5 pts		

On days we work on cases (which will be most days), please bring your textbook and a laptop computer (if you have one).

EXPECTATIONS OF MYSELF:

- I will structure the class in a way that encourages you to learn some important biological content.
- I will be accessible and professional to you, and will make all appointments on time.
- I will listen carefully to you and be courteous, and will try to answer questions to the best of my ability, even if it means saying "I don't know."
- I will grade all assignments fairly and impartially and hand them back in a timely manner.
- I will try to make learning biology as interesting as I find it myself.

EXPECTATIONS OF YOU:

- I expect you to attend class. There is a direct, positive relationship between attending class prepared and doing well. Research has shown that the more you are exposed to material, the better you will master it.
- I expect you to be professional. No cell phones, no disrespectful language, no studying for other classes or browsing the internet during lecture, etc. If I see you checking your phone during class I'll ask you to put it away. The second time I'll ask you to leave.
- I expect you to be courteous and supportive of your group members and contribute meaningfully to group work.
- I will not take attendance, however there will be many days when your group will rely on your contributions. Missing these times will hurt them as well as your own learning.
- I expect you to read through the suggested text pages *before* class. This will help you enormously to understand what I am talking about, what the in-class activity is about, or how to approach the case study. However, be aware that in some places the text goes into more detail than I will require of you. Use the class work and the case study descriptions as a guide to the level of mastery I expect.
- I expect you to seek out help when you need it. If you are having trouble keeping up or synthesizing the material, **come see me** or the tutors or both. It's very easy to fall behind in this class, and very hard to catch up later.
- Biology affects you every day, whether or not you are aware of it. Keep an eye out for any news story that you find relevant to our material and share it with the class! I will do the same.

A **tutor** for this course will be available during the semester. Hours will be posted in Nobel Hall and on Moodle. Receiving help from a tutor is a sign of taking the challenge seriously, not a sign of weakness. This person is there to help you understand important concepts presented in the course. Don't make the mistake of waiting until just before

an exam to study or seek help. Even worse, don't make the mistake of waiting until you do poorly on the first exam. Meet with me, meet with a tutor, and do it early; you'll quickly find out if your understanding is sufficient.

GROUP WORK

I will assign you to a group at the end of the first week of class. This group will work together on the case studies, and can also serve as a study and discussion group. Your group will come up with a series of Ground Rules, and periodically during the semester I will have each of you evaluate your group members (and yourselves) in Peer Evaluations.

Ground Rules

You should think seriously about what behaviors will help your group function efficiently and harmoniously, and what behaviors will ruin the group. You should decide what you will and won't tolerate from one another in the group, and agree on the consequences for violators of these ground rules. It is important to decide these at the start of the class before negative behaviors begin. I will ask for a copy of your group's ground rules printed out and signed.

You might begin your discussion about the types of rules you want by talking about past experiences with groups, listing both the positive and negative aspects. Then think about ground rules that will reinforce the positive behavior and limit the negative. Some examples of commonly used ground rules are the following:

- Come to class on time every day
- Do all assignments and be prepared to discuss them
- Notify group members of absences
- Share information
- Respect the views and ideas of others

As in the world outside your classroom, rules need to be backed up with consequences, or they may get ignored. Some examples of appropriate consequences for violators of the ground rules are the following:

- Group member will not receive a grade for an assignment for which s/he did not contribute (e.g. no "Helper" points on a Case Summary)
- Group member have a "time-out" in which s/he will do all assignments alone (e.g. all case summaries)
- After two ground-rule violations, a member can be expelled from the group permanently

Note that I must approve your list of ground rules and consequences, so that I can, if needed, help you enforce them.

GRADING

Three exams @ 45 pts each	135 pts	Grading Scale					
Semicumulative final exam	65	A	>93%	353-380	C+	77%	293-303
A variety of lecture homeworks.....	20	A-	90%	342-352	C	73%	277-292
Case Summaries (2 @ 20).....	40	B+	87%	331-341	C-	70%	266-276
Case Helping (4 @ 5).....	20	B	83%	315-330	D	60%	228-265
<u>Laboratory assignments (10 @ 10pts).....</u>	<u>100</u>	B-	80%	304-314	F	<60%	<228
Total	380 pts						

Grades will be based on the percentage scale provided (above) and not on a "curve". Thus, you will not be competing with your fellow students for a pre-determined allocation of grades. You can calculate your current grade at any time during the semester based on grades posted on Moodle. **You must pass (≥60%) at least one exam to pass the class. You also must earn a final grade of C- to move onto BIO102. Nursing students must earn a grade of C to continue in the Nursing program.** Also, for those of you interested in continuing in the sciences, remember that you also must earn a final grade of a C- in CHE107 to register for BIO201. No extra credit assignments will be available.

Exams

All **exams** will include a variety of question types, such as fill in the blank, multiple choice, and short answer questions. Exams will cover material from lectures and case studies, as well as assigned readings and the lab. I expect

you not only to recall what you've studied but to also be able to apply ideas and concepts to new situations. Practice this! Note that course policy states that you **MUST** pass at least one exam to pass the class.

Questions about your Exam: I will not answer questions or address concerns about an exam until 24 hours after it is returned to you. This will give you time to consult the posted answer key and consider your test carefully. After 24 hours, I will be glad to discuss your exam, so please do not hesitate to contact me if there is a problem. If you ask me to re-grade a question, I reserve the right to re-grade the entire exam.

LAB ASSESSMENT:

You must attend the lab for which you are registered and that instructor will grade your lab assignments. You can earn up to 10 points per lab, sometimes split into two assignments (e.g., a 4 pt. pre-lab homework due at the start of lab, and a 6 pt. worksheet due at the end of your lab). Except for exceptional cases, **no credit will be given for late work**. The total lab points will be *combined* with your lecture score to give you a single grade for lecture+lab.

Although lab homeworks and lecture assignments may be graded by different instructors, the labs cover the same concepts as lecture, and thus you can be asked about these concepts on exams. Study the underlying principles more than specific procedures. For example, you won't be asked to name the enzyme we used in a lab, but you could be expected to know how to measure the activity of an enzyme, or read a graph of enzyme activity. Also, the lab introduces concepts which do not have a single textbook chapter (i.e., statistics, graphing and hypothesis construction). Be prepared to apply this material on your lecture exam!

Make-Up Exams / Labs

If you miss an exam, you will receive a score of zero for that exam *unless* you've arranged with me ahead of time to miss it. If at any point in the semester you realize that you will have to miss (or that you have missed) an exam, you must contact me as soon as possible with a valid excuse in order to avoid receiving a zero. Please note that activities such as a job, an athletic event or other extracurricular activity, studying for another class, or oversleeping are *not* valid excuses for missing an exam.

Missing Lab for Emergencies: The laboratory part of this course is not optional. You must attend the lab section for which you are registered. If this presents a conflict during the semester (for example, if you have a doctor's appointment or a conflict with an extracurricular activity, or if you are ill or there is an emergency), you must arrange to attend a different lab section at least TWO days in advance. In this case, contact the instructor of the section that you wish to attend, as well as your regular lab instructor, as soon as possible.

If special circumstances or prolonged absences make it necessary for you to make up a laboratory activity or assignment, you should contact Eric Elias (the lab coordinator) as soon as possible. For prolonged absences, contact Eric at 933-7329 or elias@gac.edu. Please note that it may be difficult or impossible for you to attend a lab section other than your regular lab section. As with exams and quizzes, you can only avoid receiving a zero for missed laboratory work if you have a legitimate excuse.

MANAGING AT GUSTAVUS:

Probably the biggest challenge you face at Gustavus is learning good time management skills. Yes, you can do it all, but only if you plan and use your time effectively! For help with this and many other coping skills, visit the Academic Support Center in the Johnson Student Union, Room 204, or phone 933-7027: <https://gustavus.edu/advising/>

If You Need Help With Personal Matters: I am very willing to listen if you need a friendly ear, and I will treat such meetings with complete confidentiality (when I can, see next section). The Counseling Center (part of the Academic Support Center) also has people trained to help. They are there to help you and it is strictly confidential.

Title IX and Cleary Act Reporting: Title IX legislation states that violence and harassment based on sex or gender are civil rights violations. As a faculty member, I am mandated (required) to report incidents of sexual misconduct or sexual harassment. This requirement is to make sure the College can support and protect students. For more detailed information please see: <https://gustavus.edu/deanofstudents/policies/gustieguide/>

I also am required by federal and state regulations to report campus crime to Campus Safety. Disclosure to me is voluntary, but not sharing information will hinder timely warnings to the campus, the ability to respond to crime and accurate disclosure of campus crime statistics. Thanks in advance for any situation you want to share and for trusting in me to support students.

Policy on Accommodating Students with Disabilities: It is the policy of Gustavus Adolphus College to provide for the needs of enrolled students who have disabilities. In so doing, a number of individuals and departments cooperate to ensure equality of opportunity and maximal participation in the College's educational programs. Students with disabilities are encouraged to schedule an appointment with the Disability Services Coordinator (Kelly Karstad) to identify individual needs within the campus environment and to discuss ways to meet those needs. Ms. Karstad's office is in 208 Johnson Student Union and she can be reached at 933-7138. Students requesting accommodations for their disability must have documentation of the disability on file in the Academic Advising Center. Appropriate accommodations are decided on an individual basis. For more information, see: <https://gustavus.edu/advising/disability/>

English Language Learners: Students for whom English is not their first language may find help with the college's ELL support person, Jody Bryant (jbryant2@gac.edu; x7197) as well as from peer tutors in the Writing Center.

Honesty: Gustavus has an *Honor Code* that states: “*On my honor, I pledge that I have not given, received, or tolerated others' use of unauthorized aid in completing this work.*” Although this class is different from many in that I encourage group collaboration on some assignments, don't be confused by this to think that using someone else's work *instead* of your own is acceptable. Any time you take credit for work that was done by others, without giving them credit, you are plagiarizing. The trick is to give credit where credit is due. Many times you will work together, with each of you contributing important parts to the problem, but ultimately this course (like others) is about learning. When I am assessing your *individual* learning, using others' work for your own is unacceptable.

Life Science Teaching: Fulfillment of the Minnesota Teachers of Life Science Standards and Middle School Standards can be found on the Biology department website (<https://gustavus.edu/biology/>).

Biology Major: Note that to continue in a Biology major you must pass this class with a grade of C- or better, and pass all other courses that are prerequisites to biology major courses (including chemistry, Bio 102, 201, & 202) with a grade of C or better.