

Majors Biological Principles Syllabus

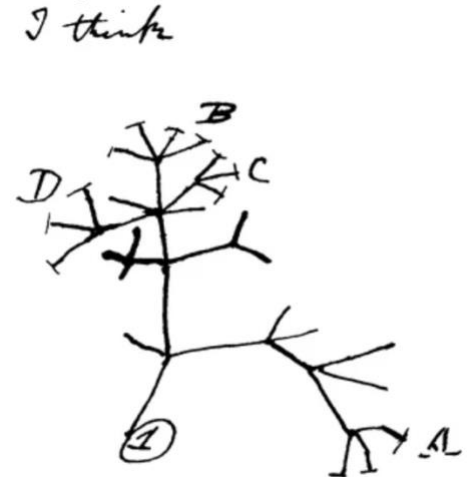
BIOS 1207

Fall 2026

3 credits

Lecture Meetings: MWF 9:30 – 10:20 am in MARC 101

Recitation Meetings: Tuesday 6:30 – 7:20 pm in ES&T L1255



Instructor Information

Joseph P. Montoya (JM)

1244 EST

404-385-0479

montoya@gatech.edu

Office hours immediately after lecture or by appointment
(email 3 times that work)

Chrissy Spencer (CS)

Boggs 176A

404-385-0539

chrissy.spencer@biology.gatech.edu

Office hours Tuesdays 9:30-11:30 (ending at 10:45 on the first Tuesday of each month) in
Boggs 1-76A or by appointment (email 3 times that work)

See Canvas for the Course TA names, emails, and office hour information.

General Course Information

Description

BIOS 1207 was designed for Biology majors. This is an **active-learning** class that will introduce you to basic principles of modern biology, including evolution, ecological

relationships, biomacromolecules, bioenergetics, cell structure, and genetics. This course will help you develop critical scientific skills including hypothesis testing, experimental design, data analysis and interpretation, and scientific communication. Class time will include a variety of **team-based activities** designed to discuss, clarify, and apply new ideas by answering questions, drawing diagrams, analyzing primary literature, and explaining medical or ecological phenomena in the context of biological principles. We will spend class time on building your comprehension of the material you find the most difficult, based on pre-class assessments. You will play a key role in determining the focus of each day's effort.

Course Learning Outcomes

By the end of this term, you will be able to:

1. Explain fundamental principles of modern biology, including evolution, ecological relationships, biomacromolecules, bioenergetics, cell structure, and genetics (Course lecture content).
2. Use scientific skills to test hypotheses, design experiments, analyze and interpret data, and communicate scientifically (Course lecture content).
3. Communicate effectively using appropriate scientific language (Group Project, Exams).
4. Appreciate commonalities and differences among people who practice science, and recognize that there are multiple pathways into science as a career (Scientist Spotlights).
5. Reflect on the usefulness of your study strategies and identify new practices to achieve your best learning (Metacognition Assignments and Exam wrappers).

Required Course Materials

Textbook: Biological Principles is taught using a flipped classroom model, meaning that *you will need to complete your assigned readings and view the included videos before each lecture*. The Biological Principles textbook is available at bioprinciples.biosci.gatech.edu. The day-by-day schedule below contains links to each required reading. Note that you can access any of the readings from any page of the textbook using the links below the image of the fern.

Learning Catalytics: To complete your pre-class incoming knowledge evaluation (IKEs), team in-class activities (TICAs), and your weekly homework assignments, students are

required to have a Learning Catalytics account. Points earned in Learning Catalytics will contribute to the "participation" portion of your course grade. Your Learning Catalytics code will come to your @gatech.edu email address. You will need to follow the instructions in your email to set up your Learning Catalytics account. Your code is good for a year and so can also be used in BIOS 1208 next semester. To participate in class, you will need to bring an internet-ready smartphone, tablet, or laptop to class to earn participation points. Phone and computer use is restricted to class-related material, and off-task use may result in loss of participation points for that day. Your entire Learning Catalytics contribution of IKEs, TICAs, and Homework tallies to 20% of the course grade.

Grading Policy:

Your final grade will depend on the following combination of scores:

In-class exams:	40%
Final exam:	20%
Incoming Knowledge Evaluations:	5%
Team In-Class Activities	5%
Homework	10%
Group project:	20%
Other Writing Assignments	5%

Note that these components total 105%, though the maximum score possible is 100%, meaning that there is 5% extra credit built into the course components. **We advocate that you attempt every assignment to the best of your ability.** We hope that knowing that you can have lower scores on 5% of your grade at no cost to your final grade will help relieve some anxiety around your course grade.

We will use the following procedure in calculating your final grade:

1. We will combine your exam, IKE/TICA, homework, group activity, and other scores into a raw composite score (0 – 100%) using the weights shown above.
2. We will use the mean score earned by the top 5% of the class as a gauge of real student performance in the class.
3. We will normalize your score to actual student performance by dividing your raw composite score by the mean score earned by the top 5% of the class. If you're in the top 2.5% of the class, your score will be 100%.
4. We will assign final letter grades using the following scale:

A: $\geq 90.0\%$, B: $\geq 80.0\%$ and $< 90.0\%$, C: $\geq 70.0\%$ and $< 80.0\%$, D: $\geq 60.0\%$ and $< 70.0\%$

In recent years, normalized and raw scores have been very similar, but this grading approach allows us to take account of actual class performance in assigning grades, if necessary. Normalization can only improve, not decrease, your final course grade, though usually it doesn't change grades.

Note that we do not constrain the final grade distribution in any way — everyone can earn an A in this class, and we'd be delighted if you all did.

Description of Graded Components

Exams: Four midterm exams and the final exam. The midterm exams will be held during class, are closed-book, and will be made up of multiple-choice and short-answer questions based on topics, materials, and discussions presented in class, in the assigned readings, and in the Learning Catalytics assignments. Quizzes may be administered unannounced.

Missed exams: If you miss an exam for any reason, you will receive a grade of 0 (zero) on that exam unless you **petition us for a makeup exam within 24 h of the start of the missed exam**, and we approve your petition. Your petition must be submitted in writing (by e-mail) and must include a legitimate reason for missing the exam. Documentation is required for any exam to be considered excused; any medical documentation should be submitted to the Dean of Students (<https://studentlife.gatech.edu/request-assistance>) and *not* to your course instructors. We encourage you to submit your petition before the exam if you know of your scheduling conflict in advance. We will consider each petition individually. Examples of legitimate reasons to miss an exam include your own illness, illness or death in your immediate family, and participation in official university activities. If we approve your petition, we will either administer a makeup exam or remove the missed exam from your grade calculation, at our discretion.

LC Incoming Knowledge Evaluations (IKEs): Before each class, we'll expect you to complete the pre-class readings on the website. Once you've reviewed the material, log in to Learning Catalytics to complete that day's Incoming Knowledge Evaluation (IKE). IKE sessions close before the start of class and will not be reopened for credit, but you can review closed sessions for study purposes. We'll use your responses to guide what we do in class. IKE questions are not often at the same level as you can expect to see on an exam; instead, they ensure that you come to class with effective baseline knowledge to work up to exam-level questions in class.

All IKE and TICA sessions are graded for participation and count equally. We will drop the four lowest IKE/TICA scores from your participation grade.

LC Team In-Class Activities (TICAs): Attendance in lecture correlates strongly with performance in Biological Principles. We will make our lecture materials available and urge you to download and print them for use in active note-taking during class. Much of the material and application of ideas needed for success in this course will be presented only in lecture and assessed via Learning Catalytics. Questions presented in class are usually at the same level as exam questions. TICA sessions in Learning Catalytics close at the end of class, with a few exceptions, and will not be reopened for credit, but you can review closed sessions for study purposes.

All IKE and TICA sessions are graded for participation and count equally. We will drop the four lowest IKE/TICA scores from your participation grade.

LC Homework: Homework assignments will be posted each week in Learning Catalytics and are always *due at 11:59 pm Monday*. Homework assignments close when due and will generally not be reopened for credit, but you can review closed sessions for study purposes.

All homework assignments are graded for participation and count equally. We will drop the lowest homework score from your participation grade

Group Projects: Groups of 4-5 students will explore a recent scientific advance related to the topic of one of the course modules and prepare a video summary of the paper as well as a biography of one of the scientists involved. Each student will be assigned to a group, and each group will produce a video presentation and a Scientist Biographical Sketch for review by faculty and fellow students. Grades will be based on instructors' scores and peer evaluations. Each group member is fully responsible for all submitted project work and each member will receive the same project grade. Students whose peer reviews show that they didn't contribute fully will receive a penalty reflecting their contribution. Deadlines are on the course schedule below. Additional details will be available after the end of the drop/add period.

Writing Assignments: On Canvas, we will release 6 assignments that require writing, thinking about your learning, and reflection. These assignments are required and include Scientist Spotlights and Metacognition Assignments. These assignments will be posted on Canvas and are due on select Thursdays by 11:59 PM on the posted dates. **You may complete these assignments as soon after they open as you wish; there is no need to wait until the deadline.** These assignments will be subject to plagiarism review by

Turnitin. Please see the section on Academic Integrity to learn more about plagiarism and how it is handled in this course.

We will drop the lowest Writing Assignment score from your course grade.

Organization

The full course schedule is shared on the Canvas course home page in a separate file. The course is organized into five modules, each of which deals with a major theme or area of modern biology. Our learning goals for each module are listed below.

Module 1 Evolution includes an introduction to the scientific method before covering Earth history, the history of life on Earth, and the mechanisms of evolution.

Module 2 Genetics includes DNA, gene regulation in prokaryotes and eukaryotes, mendelian genetics, and genomics

Module 3 Biomolecules is an introduction to bioenergetics, including respiration and photosynthesis, chemiosmosis in respiration and photosynthesis, and the diversity of metabolic pathways.

Module 4 Ecology covers behavior and evolution, simple population models, community structure, and mass and energy flow through ecosystems.

Module 5 Integrative Biology is a course synthesis that addresses recombinant DNA technology & bioethics, genetic diseases as model biological systems, and immunology.

Course Policies

Staying focused in class

We've noticed that constant cell phone and internet access in combination with social media can cause students to be distracted in class. Please do what you can to come to class and focus on learning biology without distraction for 50 minutes. This includes putting away texts, social media, internet browsing, and homework for other classes. Spend the class time with us and consider it part of your study time to learn biology and do well on the exams.

Missed classes

If you are unable to attend lecture, here are the steps you should follow: complete the pre-class work, then work with a classmate to obtain and review the lecture notes and materials. Finally, schedule an appointment with a Lecture TA to review any content that you would like clarification on. You are welcome to let us know you will be missing class.

Course Communication Expectations

All course communication will come through your @gatech.edu email account, usually in the form of Canvas announcements. We will announce assignment deadlines, send LC session IDs, let you know about extra credit opportunities, and send test and review sessions reminders, and more. Please make it a habit to check your @gatech.edu email every day during the semester so that you are current with this course and other events at Tech. Check regularly in your spam and in your “other” folders if using the focused inbox.

If you wish to reach us, please send us both an email from your gatech.edu account with “BIOS 1207: Your Name” in the subject line. We ask that you **not** use Canvas mail because it does not allow more than one recipient and we do not see it in our email inboxes.

Recitation

Lecture recitations, led by a Lecture TA, occur weekly on Tuesdays at 6:30 pm. Recitation is a weekly review session. Attendance is optional but strongly encouraged, as recitation is designed to improve your understanding of the lecture material, give you the opportunity to ask questions, practice writing test-like essay questions, and to work additional problems.

Lab BIOS 1207L

The BIOS 1207L lab is separate from the lecture portion of the course. All information about lab, including the lab instructors and course syllabus for lab, are on the lab Canvas site. Labs will not meet the first week of class, but please check the lab Canvas site for the syllabus and important announcements.

Academic Integrity

Georgia Tech aims to cultivate a community based on trust, academic integrity, and honor. Students are expected to act according to the highest ethical standards. For information on Georgia Tech's Academic Honor Code, please visit <https://osi.gatech.edu/content/honor-code>.

Any student suspected of cheating or plagiarizing* on a quiz, exam, or assignment will be reported to the Office of Student Integrity, which will investigate the incident and identify the appropriate penalty for violations.

*Plagiarism is the unattributed use of the words, works, or ideas of others. Plagiarism on any assignment, including laboratory reports and the group project, will be referred to the Office of Student Integrity for adjudication. If you have any questions regarding your assignments and plagiarism, we encourage you to consult with any of us before you submit the assignment.

During exams, cell phones must be turned off and access to any website or resource is forbidden. Students in violation of these policies during an exam will be referred to the Office of Student Integrity.

Core IMPACTS

This is a Core IMPACTS course that is part of the STEM area.

Core IMPACTS refers to the core curriculum, which provides students with essential knowledge in foundational academic areas. This course will help students master course content, and support students' broad academic and career goals.

This course should direct students toward a broad Orienting Question:

- How do I ask scientific questions or use data, mathematics, or technology to understand the universe?

Completion of this course should enable students to meet the following Learning Outcome:

- Students will use the scientific method and laboratory procedures or mathematical and computational methods to analyze data, solve problems, and explain natural phenomena.

Course content, activities and exercises in this course should help students develop the following Career-Ready Competencies:

- Inquiry and Analysis
- Problem-Solving
- Teamwork

Learning Accommodations

We will gladly make course accommodations for students with disabilities. These accommodations must be arranged in advance through the [Office of Disability Services](http://disabilityservices.gatech.edu/) (<http://disabilityservices.gatech.edu/>). If your accommodations involve more than extended time on exams, please come see one of us in office hours or by appointment to discuss how we can best work with you on the accommodations.

Artificial Intelligence (AI) Policy

AI may be used in any capacity in any writing assignment for this course, and any use of AI must be acknowledged appropriately in the AI Contributions section of the assignment. The AI Contributions portion should be included in every writing assignment and must include the following: a) identify the AI you used; b) describe how you used it/what you used it for; c) state the reason you chose to use AI in this way; d) describe what steps you took to verify the AI output. A separate entry should be included for each AI platform that you used. If you did not use any form of AI in your assignment, then your AI Contributions section must include the following: a) state that AI was not used, and b) explain the reason you chose not to use AI. Any indication that AI was used without proper acknowledgement may result in referral to OSI for investigation of academic misconduct. With any use of AI, you should always scrutinize any editing or response you get from the AI; although AI tools are becoming more sophisticated and can generate answers to increasingly complex questions, this does not mean that they are the correct answers.

Student-Faculty Expectations Agreement

As members of the Georgia Tech community, we are committed to creating a learning environment in which all of our students feel safe and included. Because we are individuals with varying needs, we rely on your feedback to achieve this goal. To that end, we invite you to enter into dialogue with us about the things we can stop, start, and continue doing to make our classroom an environment in which every student feels valued and can engage actively in our learning community. Your TAs can anonymize your feedback if you'd like them to share your comment to the faculty instructors.

Intellectual Property and Copyright:

With the exception of third-party material, course materials provided in by the instructors are licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License. Sharing course materials on commercial websites—like Quizlet, Kahoot!, and Cram—is in violation of this license.

Office Hours

Office hours are a time to meet with an instructor one-on-one or in a small group to seek clarification on course concepts, assignments, or discuss other topics. For regular office hours, you can just drop in without an appointment – just come by!

Prerequisite Knowledge

We find that high school chemistry and biology background provide an effective background for students to be successful in Biological Principles. We provide a short chemistry primer in our online textbook at the point in the course that is most useful. If you

feel that you need additional resources, please come see us in office hours so we can help you.

Tutoring

Georgia Tech offers a variety of free learning and communications support options. Learn about free tutoring resources at tutoring.gatech.edu and Tutoring in Clough Commons 273. For assistance with revising lab reports or building and polishing a group project presentation, consult the Naugle Writing and Communication Center (Clough Commons 447 or commlab.gatech.edu).

Campus Resources for Students

Student Engagement & Well-Being provides the following resource guide for students:
<https://students.gatech.edu/student-resource-guide>