Majors Biological Principles

Last Updated: Thu, 07/10/2025

Course prefix: BIOS

Course number: 1207

Section: A

CRN (you may add up to five):
86769

Instructor First Name: Joseph

Instructor Last Name: Montoya

Semester: Fall

Academic year: 2025

Course 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).
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 strategies and practices to achieve your best learning strategies (Metacognition Module and Exam wrappers).

Required course materials:

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.

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 Homeworks 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%
Avoiding Plagiarism	2%
Other Writing Assignments	7%

Note that these components total 108%, though the maximum score possible is 100%, meaning that there is 9% 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 9% 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: ≥ 90.0%

B: ≥ 80.0% and < 90.0%

C: ≥ 70.0% and < 80.0%

D: ≥ 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.

Attendance policy:

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.

Academic honesty/integrity statement:

Students are expected to maintain the highest standards of academic integrity. All work submitted must be original and properly cited. Plagiarism, cheating, or any form of academic dishonesty will result in immediate consequences as outlined in the university's academic integrity policy.

Core IMPACTS statement(s) (if applicable):

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