Course Description:

In this **active-learning** course, you will explore the basic principles of modern biology, including biomacromolecules, bioenergetics, cell structure, genetics, evolution, and ecological relationships. You will also develop scientific skills in analyzing and interpreting scientific data to test hypothesis and communicate scientifically. Finally, you will develop and practice skills in metacognition to identify your best learning strategies that you will be able to employ in your future courses and career. **Class time** will consist of 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 on the material you find the most difficult, based on pre-class assessments.

Learning Objectives:

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

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

Grading Policy and Weighting:

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

Midterm exams (approximately 11.5% each, see below)	50%
Final exam (Module 5 and cumulative):	20%
Writing Assignments (6 total, equally weighted, 2.5% each)	15%
Participation* (equally weighted; see # 2 below)	20%

*all participation sessions are graded for completion, not accuracy.

These components add up to 105%, and scores will be calculated out of 100% (it will not normalized over 105%), meaning that there is 5% extra credit built into the course components. We will use the following procedure for calculating your final grades:

1. Your midterms will be weighted 17%, 13%, 13%, and 7%, where your highest midterm score will count for the highest amount, and your lowest midterm score will count for the lowest amount of your final grades
2. Each IKE, TICA, and HW is worth 1 point; the total score you earn is divided by the total number of assignments offered (dropping the lowest scores per the missed CL session policy described under Missed Participation)
3. 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%
   F: < 60.0%

The above scale is the most stringent that will be used, and you are not competing with anyone for your grade.

Required Course Materials:

This course is taught using the flipped classroom model, meaning that you will need to complete the assigned readings before each lecture. This course is taught without a commercial textbook, and all course readings and videos are on the course online textbook at https://bioprinciples.biosci.gatech.edu/. The course schedule below contains links to each required reading and videos. Required pre-class, in-class, and homework activities will be conducted through Codon Learning. *Information for how to access Codon Learning will be shared at the start of the semester.* Points earned in Codon will contribute to the "participation" portion of your course grade. To participate in class, you will need to have an internet-ready smartphone, tablet, or laptop in class. Phone and computer use should be restricted to class-related material, and off-task use may result in loss of participation points for that day. Piazza is free online forum, will be used for online discussions and Q&A outside of class.

Course Policies

Communication Expectations:

We ask that you post to our Piazza site for any clarifying questions related to course content, rather than using individual email. You can make your post anonymous to other students if you prefer. Piazza can be accessed from our course Canvas site. Please use email only for highly individualized/personal questions, such as those related to absences, missed or late assignments, disruptions to Codon Learning access, feedback on your writing assignments, etc. When emailing your instructors, include the course number (BIOS 1107) in the subject of your email. We require prompt and proactive communication by email in order to address any course issue you might experience, including but not limited to the list above.

We will utilize Canvas Announcements for all course communications. **Confirm that you are receiving Canvas Announcements to your email: In Canvas, Go to Account > Notifications and turn on email "Notify immediately" for Announcements**

Attendance and Participation:

There will typically be seven participation assignments each week delivered via Codon Learning (CL): three IKEs, three TICAs, and one HW (see below for details). All participation assignments are equally weighted and are graded for completion rather than accuracy: *you receive full credit for full completion of each participation assignment whether you get the answers right or wrong*. We grade for completion rather than accuracy so that you are safe to use these assignments to authentically test your knowledge, rather than looking up answers in the textbook or your notes. **You do not learn from looking things up in your notes.** IKEs, TICAs, and HWs are not reopened after they close (they cannot be submitted late), but you can review closed sessions for study purposes. A set number of the lowest scoring CL sessions will be dropped for every student at the end of the term, and additional drops will not be granted beyond this set number. See the **Missed Participation** policy below for details.

- **Incoming Knowledge Evaluations (IKEs)**: Before each class, we'll expect you to complete and take notes (in your own words) on the pre-class readings on the website. Once you've reviewed the material, log in to Codon Learning to complete that day's Incoming Knowledge Evaluation (IKE); you should complete the IKE based on recall only (closed note) so that you can test yourself in preparation for class. IKE sessions close promptly at the start of class. We'll use your responses to guide what we do in class. IKE questions are often not 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. IKEs will typically open approximately 40 hours before class and will close promptly at the start of class.
- **Lectures and Team In-class Activities (TICAs)**: Attendance and participation in lecture correlate strongly with performance in this course. We will make our lecture materials available and urge you to download 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 Codon Learning. Questions presented in class are usually at the same level as exam questions. TICA questions will typically only be available during class time.
- **Homeworks**: Homework assignments will be made available each weekend in Codon Learning. Homeworks will typically open on Friday afternoons and will close on the following Tuesday by 11:59pm.

Absences:

Regular attendance and active participation during class time are correlated with better performance in the course. If you miss class, you should get notes from a peer and meet with a TA to get your content questions answered. If you experience any situation that causes you to miss more than one consecutive class or otherwise interferes with your ability to keep up with course assignments, we ask that you request assistance from the Dean of Students using this link: https://studentlife.gatech.edu/request-assistance. Select "Class Absence Verification" for documentation of an absence, including missed exams. Select "Meeting with a Dean" for any other issue that is interfering with your ability to succeed in this or any other course. Missed exams fall under the **Missed Exams** policy. Missed participation sessions due to absences for any reason fall under the **Missed Participation policy**.

- **Missed Participation (IKEs, TICAs, and HWs):** We will drop the 14 lowest CL scores for all students to account for absences related to illness, institute-approved absences, and any other situation. **Requests for additional drops will not be granted, and you are encouraged to save your drops for dates when you are unavoidably unable to participate for any reason**. Missed CL sessions cannot be made up, and students away from campus are encouraged to complete asynchronous CL assignments (IKEs and HWs) if they are able to do so. There is no need to email us if you miss a day of class if it only affects an CL session. Drops will be applied at the *end* of the term and not sooner. Each assignment is worth a small amount. *HWs, IKEs, and TICAs are graded for completion, not accuracy.*
- **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) with 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. You are encouraged to submit your

petition before the exam if you know of your scheduling conflict in advance. Examples of legitimate reasons to miss an exam include illness, illness or death in your immediate family, and participation in official university activities. Requests for makeup exams due to missed class for religious observances also require documentation and must be submitted to the Registrar's Office using the Instituted Approved Absence Form **within the first two weeks of the semester** as per the Registrar's Office guidelines: https://registrar.gatech.edu/info/institute-approved-absence-form-for-students. We will consider each petition individually. For students with approved petitions, we will either administer a makeup exam or replace your missed exam score with the average of your other exam scores, weighted by the class average for each exam. Exam grade replacement is intended only in situations where it is not feasible to administer a makeup exam. The formula to calculate your score on a missed exam is: (your missed exam score) = (class average of missed exam) x [(sum of your scores on exams you took) / (sum of class averages on exams you took)]

Academic Honesty:

All students are expected to abide by the Academic Honor Code (https://policylibrary.gatech.edu/student-life/academic-honor-code) and the Student Code of Conduct (https://catalog.gatech.edu/rules/18/). Academic dishonesty in any form will not be tolerated. Academic dishonesty includes cheating, lying about course matters, plagiarism, submitting someone else's work as your own, stealing classroom materials, or helping others commit a violation of the Honor Code. Plagiarism includes any form of representing the words or ideas of others as your own. Cell phones must be off/silenced and placed face-down on the desk during exams. Any student found with a phone or other unapproved electronic device on their person during testing will be referred to the Office of Student Integrity. Suspected violation of the Academic Honor Code in any form may be referred to the Office of Student Integrity for adjudication.

Student-Faculty Expectations:

The Georgia Tech Student-Faculty expectations may be viewed here: https://catalog.gatech.edu/rules/22/

Students with Accommodations:

We will make classroom accommodations for students with documented accommodation needs per the Office of Disability Services. These accommodations should be arranged in advance and in accordance with the Office of Disability Services (http://www.disabilityservices.gatech.edu). Students with accommodations on exams must schedule their exams at least five business days in advance with the testing center, and exams at the Testing Center must be scheduled to occur on the same day and at the same time as the scheduled exam. Students who are unable to schedule on the same day and time as the exam must have instructor permission to take the exam at an alternative time or day. Students with accommodations on exams forego those accommodations if they choose to take the exam in the classroom.

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