Principles of Physics I (IPLS I - 2025F)

Last Updated: Sun, 01/04/2026

Course prefix: PHYS

Course number: 2212

Section: LS

CRN (you may add up to five):
28896

Instructor First Name: Nicholas

Instructor Last Name: Darnton

Semester: Spring

Academic year: 2026

Course description:

The Introductory Physics of Living Systems (IPLS II) section includes some thermodynamics and statistical mechanics as applicable to biochemical systems, electrostatics and magnetostatics, circuits, electromagnetic waves and spectroscopy. This is a calculus-based course.

Course learning outcomes:

- Apply a small set of fundamental physical principles to a wide variety of situations.
- Use these principles to explain a wide variety of physical phenomena.
    - Communicating scientific ideas is a big part of the laboratory.
- Make macro-micro connections, based on the atomic nature of matter.
- Model physical systems: make idealizations, simplifying assumptions, estimates.
- Construct computational models to predict the time evolution of system behavior.

Required course materials:

Codes for the required textbook (Knight, Jones and Field *University Physics for the Life Sciences*, 1st edition, Pearson, 978-0137394579) and homework system (MasteringPhysics) will be supplied free of charge to registered students in the first week of class.

Some lab experiments require students to have a smartphone (for video recording) and a laptop/computer (for coding and video analysis).

Grading policy:

Numerical ranges for final grades are as follows:

- A = 90-100 points
- B = 80-89 points
- C = 70-79 points
- D = 60-69 points
- F = 0-59 points

Final grades will not be curved.

To accurately compute your final course grade, you *cannot* rely on the Canvas gradebook; you *must* use the spreadsheet found in Canvas > Files > Misc > IPLS Grading workbook.xlsx

The Core Points

A total of 88 core points are allocated as follows:

- 45 pts – Tests
  - Weighted: lowest scoring test is 12 pts, middle score is 15 pts, highest score is 18 pts
- 25 pts - Final Exam
- 18 pts – Laboratory
  - 10 pts for experiments
  - 5 pts for quizzes
  - 3 pts for other activies, including pre-lab assignments, recitation attendance and peer review completion
- **The Bucket Points**
  - In addition, you can earn up to 12 bucket points from the (more than 12 points' worth) of categories below. These assignments cannot be excused or made up; missing points are earned by completing additional bucket activities.
  - 6 pts – Online homework
  - 4 pts – Written homework
  - 4 pts – Lecture participation
  - 2 pts – Seminar reviews

Attendance policy:

Lecture attendance. Lecture attendance is not required, but participation credit will be given only for those physically present, as measured through interactions with a "clicker" app.

Lab Meetings. Attendance at the lab meetings (where students take quizzes and work collectively on recitations and/or experiments) is mandatory. Some labs require two weeks to complete, in which case attendance at both weeks is required to earn credit. Labs are not optional, and a student who does not complete the lab portion of the course will fail the course regardless of scores on tests, exams, etc. A *single* makeup experiment is available

for excused missed experiments during the semester.

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.

The policy on academic honesty as stated in the Honor Code will be fully enforced during this course for both the instructors and student. All Honor code violations will be referred to the Dean of Students office.

- Collaboration with other students in this course on homework assignments, most lab assignments, and in-class activities is permitted and encouraged.
    - For *group* lab experiments, students are allowed to collaborate in performing the experiment and collecting data and writing up the results. All experiments performed during lab periods are group experiments.
- **Collaboration is NOT PERMITTED during quizzes, tests or the final exam.**
    - These activities are closed internet, closed books, closed notes, with the following exceptions:
        - Students are allowed a copy of the formula sheet found on Canvas (which will be included in the exam papers).
        - Students are allowed blank sheets of paper (which will be included in the exam papers).
        - Students are allowed a calculator (as long as it cannot communicate with other calculators, which means no smartphone calculator apps are allowed).
    - Students must work on the tests individually and receive no assistance from any other person or resource.
    - Work submitted outside of the testing period will not be graded.
    - In addition, collaboration is not permitted on *individual* lab writeups.
- Students who post course content to online resources external to Georgia Tech (e.g, Chegg) will be referred to the Dean of Students office for Academic Misconduct.

Core IMPACTS statement(s) (if applicable):

This is a Core IMPACTS course that is part of the Technology, Mathematics & Sciences area.

Core IMPACTS refers to the core curriculum, which provides students with essential knowledge in foundational academic areas. This course will help 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