Principles of Physics I (GTE/BCN 2025F)

Last Updated: Sun, 01/04/2026

Course prefix: PHYS

Course number: 2211

Section: R

CRN (you may add up to five):
85616

Instructor First Name: Nicholas

Instructor Last Name: Darnton

Semester: Fall

Academic year: 2025

Course description:

An introductory course which will include mechanics (kinematics, dynamics, work and energy, momentum and collisions, and rotational motion and statics), and may also include oscillations and computational methods. 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:

In an effort to reduce cost to students, we are offering this course using a combination of instructor created content and open-access resources. This means students are not required to purchase a textbook or pay a lab fee. Our curriculum will, however, roughly follow the **Matter & Interactions**, Vol. I: Modern Mechanics, 4th Edition by R. Chabay & B. Sherwood (John Wiley & Sons 2015). If students prefer a traditional textbook as a study aid, we recommend purchasing a used copy (even the 3rd edition should work).

The Georgia Tech Library has a few physical copies of the textbook available for students to borrow or to make photocopies. **Ask at the INFODesk: Grove Level, Price Gilbert; QC23.2 .C43 2015**

The 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.

You can use the Canvas gradebook to keep track of your progress in this course. However, please note that the Canvas gradebook cannot accommodate our test weighing scheme or the bucket points. This causes a small but sometimes significant error in the overall grade that Canvas reports to students.

To accurately compute your final course grade, you CANNOT rely on the Canvas gradebook; instead you MUST use the spreadsheet found in Files > Documents > WhatsMyGrade2211.xlsx

The Core Points

All students must participate in these activities or receive a zero for the assignment. Please contact the Course Coordinator to be excused from these activities.

- 40 pts – Tests
    - Weighted: lowest scoring test is 5pts, middle score is 15pts, highest score is 20pts
- 25 pts - Final Exam
- 25 pts – Laboratory
    - 15pts for the Lab Experiments (video lab reports + peer grading)
    - 10pts for Group Problem Solving (GPS)

The Bucket Points

There are various categories of bucket point assignments totaling 20 points. Students can earn up to **10 points max** toward their final grade through any combination of the bucket point activities. These assignments cannot be excused or made up; missing points are earned by completing additional bucket activities. Partial credit can be earned in all categories. No extra credit is earned from completing more than 10 bucket points.

- 12 pts – Homework
- 3 pts - Weekly previews

- 1 pt - Test wrappers
- 1 pt - Wiki resource
- 1 pt - Public lecture reviews
- 1 pt - Midterm survey
- 1 pt - Edstem participation

The Extra Credit

You have the opportunity to earn up to 1 point of extra credit to be added to your final course grade. This can be earned by completing the Physics Pre/Post Tests and the Problem Solving Surveys.

Attendance policy:

Lab Meetings. Attendance to the lab meetings (where students work on GPS and Lab Experiments) is mandatory. Students who need to miss a lab meeting must complete the GPS Excused Absence form to be excused from the GPS. Since Lab Experiments follow two-week cycles, missing one lab meeting does not excuse a student from completing the lab experiment.

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, lab assignments, and in-class activities is permitted and encouraged.
    - For lab experiments, students are allowed to collaborate in performing the experiment and collecting data, but all data analysis, coding, and video lab reports must be individual.
- **Collaboration is NOT PERMITTED during 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.
- 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