

## Phys 243-E01: College Physics 1 (3 credits)

Fall 2021



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**Office hours:** Tuesdays and Thursdays from 9 am to 10 am and online by appointment. Office hours will be held in room 303 in Katherine Johnson Hall or on Zoom. For online meetings, a link will be provided.

### Course Description

Physics is the fundamental science. Its principles govern all-natural phenomena as well as technologies that enable modern civilization. This course will introduce students to the concepts of Newtonian Mechanics, Fluids, Harmonic Oscillations, Waves, Sound and Thermodynamics. This course meets GMU's core requirements.

### Required Textbooks

Giambattista, Physics, 5<sup>th</sup> Edition. Chapters 1→15 will be covered.

### Course Learning Outcomes

Phys 243 is an algebra-based introductory physics course that is part of Mason's core.

### The goals and learning outcomes are as follows:

1. Understand how scientific inquiry is based on investigation of evidence from the natural world, and that scientific knowledge and understanding
  - a. evolves based on evidence
  - b. differs from personal and cultural beliefs
2. Recognize the scope and limits of science
3. Recognize and articulate the relationship between the natural sciences and society and the application of science to societal changes (e.g. health, conservation, sustainability, energy, natural disasters etc.)
4. Evaluate scientific information (e.g. distinguish primary and secondary sources, assess credibility and validity of information)
5. Participate in scientific inquiry and communicate the elements of the process, including:
  - a. Making careful and systematic observations
  - b. Developing and testing a hypothesis
  - c. Analyzing evidence
  - d. Interpreting results

## Course-specific Hardware/Software

**Scientific Calculator:** You are required to have a scientific calculator. (Be sure you know how to use it – especially for trig functions.) You may also use a graphic calculator. You may not use a calculator that contains physics formulae or notes or has wireless capability.

**Webcam:** You will need a webcam if you want to meet with me via zoom. You need to turn on your webcam during those meetings.

## Assignments Description

Assignments consist of quizzes which are open book, discussion posts which account for participation, homework (**Connect**), two midterm exams and a final exam.

## Homework

All homework assignments need to be completed in **Connect**. Details will be provided on the first day of class.

**Exams:** The tests and exams in this course will be nominally 40% conceptual questions and 60% free-form problems, though the percentages could vary significantly from test-to-test. Questions will tend to focus on understanding of the concepts and principles of physics under study; whereas the free-form problems will tend to be quantitative and similar to the problems at the end of each chapter. There are no extra credit projects.

**Grade Calculation** - There will be two tests and a final exam. The final exam is cumulative. Components in your final grade are as follows:

Exams (2):	40% (20% each)
Homework	15%
Quizzes	10%
Class Participation (Discussions)	5%
Final Exam	30%

## Grading Scale:

Percentage	Letter Grade
97-100	A+
93-96.9	A
90-92.9	A-
87-89.9	B+
83-86.9	B
80-82.9	B-
77-79.9	C+
73-76.9	C
70-72.9	C-
60-69.9	D
< 60	F

## Course Policies

**Late Assignments:** All assignments must be turned in within 48 hours of the due date.

**Instructor-Student Communication:** I will respond to your emails within 12-24 hours. If I will be away from email for more than one day, I will post an announcement in the Blackboard course folder.

## University Policies and Resources

- a. **Academic Honesty:** You are expected to be familiar with and abide by the University's Honor Code. The Code can be found [here](#). It is your responsibility to see me if you have questions about these policies. George Mason University has an honor code that states the following:

*To promote a stronger sense of mutual responsibility, respect, trust, and fairness among all members of the George Mason University community and with the desire for greater academic and personal achievement, we, the student members of the University Community have set forth this: Student Members of the George Mason University community pledge not to cheat, plagiarize, steal, or lie in matters related to academic work.*

- b. Students must follow the university policy for “**Responsible Use of Computing**” which you can access through the course website.
- c. Students are responsible for the content of university communications sent to their George Mason University email account and are required to activate their account and check it regularly. All communication from the university, college, school, and program will be sent to students solely through their Mason email account.
- d. [The George Mason University Counseling and Psychological Services \(CAPS\)](#) staff consists of professional counseling and clinical psychologists, social workers, and counselors who offer a wide range of services (e.g., individual and group counseling, workshops and outreach programs) to enhance students' personal experience and academic performance. Counseling Center: Student Union I, Room 3129, 703-993-2380.
- e. Students with disabilities who seek accommodations in a course must be registered with the [George Mason University Office of Disability Services \(ODS\)](#) and inform their instructor, in writing, at the beginning of the semester. All academic accommodations must be arranged through that office. Please note that accommodations **MUST BE MADE BEFORE** assignments or exams are due. I cannot adjust your grade after the fact.
- f. Students must follow the university policy stating that all sound emitting devices shall be turned off during class unless otherwise authorized by the instructor.
- g. [The George Mason University Writing Center](#) staff provides a variety of resources and services (e.g., tutoring, workshops, writing guides, handbooks) intended to support students as they work to construct and share knowledge through writing. University Writing Center: Robinson Hall B Room 213, 703-993-1200. The writing center includes assistance for students for whom English is a second language.
- h. **Diversity:** George Mason University promotes a living and learning environment for outstanding growth and productivity among its students, faculty and staff. Through its curriculum, programs, policies, procedures, services and resources, Mason strives to maintain a quality environment for work, study and personal growth.
- i. **COVID Safety:** All students taking courses with a face-to-face component are required to follow the university's public health and safety precautions and procedures outlined on the university Safe Return to Campus webpage

(<https://www2.gmu.edu/safe-return-campus>). Similarly, all students in face-to-face and hybrid courses must also complete the Mason COVID Health Check daily, seven days a week. The COVID Health Check system uses a color code system and students will receive either a Green, Yellow, or Red email response. **Only students who receive a “green” notification are permitted to attend courses with a face-to-face component.** If you suspect that you are sick or have been directed to self-isolate, please quarantine or get testing. Faculty are allowed to ask you to show them that you have received a Green email and are thereby permitted to be in class.

- j. Students are required to follow Mason's current policy about facemask-wearing. As of August 11, 2021, **all community members are required to wear a facemask in all indoor settings**, including classrooms. An [appropriate facemask](#) must cover your nose and mouth at all times in our classroom. If this policy changes, you will be informed; however, students who prefer to wear masks either temporarily or consistently will always be welcome in the classroom.

## Course Schedule

Lecture			
Date	Topic	Date	Topic
T 08/24	Ch. 1: Introduction	R 08/26	Ch. 2: 1-D Kinematics
T 08/31	Ch. 3: 2-D Kinematics	R 09/02	Ch. 3: 2-D Kinematics
T 09/07	Ch. 4: Force, Newton's Laws	R 09/09	Ch. 4: Force, Newton's Laws
T 09/14	Ch. 4: Force, Newton's Laws	R 09/16	Ch. 5: Circular motion
T 09/21	Ch. 5: Circular motion	R 09/23	Ch. 6: Conservation of energy
T 09/28	Ch. 6: Conservation of energy	R 09/30	Ch. 6: Conservation of energy
T 10/05	Ch. 7: Linear momentum	R 10/07	<b>Exam 1: Ch. 1, 2, 3, 4, 5</b>
T 10/12	<i>Columbus Day Recess (no Tuesday classes)</i>	R 10/14	Ch. 8: Rotational motion
T 10/19	Ch. 8: Rotational motion	R 10/21	Ch. 9: Fluids
T 10/26	Ch. 9: Fluids	R 10/28	Ch.10: Elasticity and Oscillations
T 11/02	Ch.10: Elasticity and Oscillations	R 11/04	Ch.11: Waves
T 11/09	Ch.11: Waves	R 11/11	<b>Exam 2: Ch.: 6, 7, 8, 9, 10</b>
T 11/16	Ch.12: Sound	R 11/18	Ch.13: Temperature and Ideal Gas
T 11/23	Ch.14: Heat	R 11/25	<i>Thanksgiving Recess</i>
T 11/30	Ch.15: Thermodynamics	R 12/02	Ch.15: Thermodynamics
	<b>Final Exam</b>	<b>R 12/09</b>	<b>10:30 am – 1:10 pm</b>