

Phys 245-E01: College Physics 2 (3 credits)

Spring 2023



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Instructor: Dr. Gabriele Belle

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Office: KJH 303

Office hours: Tuesdays from 1:30 am to 3:00 pm and by appointment.

Class meeting: Colgan Hall 203

Time: 1200 - 1315

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 Electric Fields, Electric Circuits, Electromagnetic Waves, Geometric Optics and Optical Instruments, Diffraction and Interference, Physics of the Atom and Nuclear Physics and Energy. This course meets GMU's core requirements.

Required Textbooks

Giambattista, Physics, 5th Edition. Chapters 16→29 without 21 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

Technology Requirements

Software: This course uses Blackboard as the learning management system. You will need a browser and operating system that are listed compatible or certified with the Blackboard version available on the [myMason Portal](#). See [supported browsers and operating systems](#). Log in to [myMason](#) to access your registered courses.

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.

Description of Assignments

Assignments consist of reading quizzes which are open book, homework which must be completed in **Connect**, two midterm exams, and a final exam. There are no extra credit projects.

Homework

All homework assignments need to be completed in Connect and submitted before or on the due date. Late assignments will be penalized with a 2%/day reduction of the grade assigned by Connect.

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. Make-up or re-take exams could differ from the original exam.

Reading Quizzes

At the end of each lecture topic you will need to complete a short reading quiz. You have 60 minutes to complete the quiz. It is open book and open notes. Late quizzes will not be accepted. All quizzes must be submitted before or on the due date. Quizzes are made available at the beginning of the course and will become unavailable after the due date.

Participation

Participation will be evaluated with various in-class assignments, such as pop-up quizzes, worksheets, etc. If you miss an assignment because you leave the room or you decided not to participate, you won't be able to make up lost participation points.

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 (Connect)	15%
Quizzes	10%
Class Participation	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 and Classroom Conduct

Classroom Courtesy: You are expected to observe the rules of courtesy, including avoiding conversation during class, coming to lecture on time, and not leaving before the end. Students are encouraged to ask questions but it may be necessary to limit discussion of a topic in order to keep on schedule or because the topic will be discussed later.

Computer Use: Laptops are not allowed during the lecture. You must use paper and pen or pencil for notetaking. Laptops must be closed when the lecture begins. You may use an iPad or digital writing pad if this is your preferred way of notetaking.

Cell Phones: Cell phones must be turned off and stowed away during lecture.

Eating and Drinking during the Lecture: Eating is not allowed during my lecture as it is also distracting to other students.

Exams: There are no bathroom breaks during the exams. If you go to the bathroom, you must turn in the exam and you are done with the exam.

Late Assignments: All assignments must be turned in before or on the due date. A 2% penalty per day will be automatically applied for homework submitted after the due date. Quizzes will become unavailable after 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.

Office Hours: My office hours are in person only unless you are sick, then you can make an appointment via zoom. Office hours are a good time to introduce yourself, to tell me about any difficulties you encounter with homework problems or quizzes and discuss topics from the lecture material. Please, don't hesitate to stop by.

University Policies and Resources

Academic Integrity: GMU is an Honor Code university; please see the university catalog for a full description of the code and the honor committee process. The principle of academic integrity is taken very seriously and violations are treated gravely. What does academic integrity mean in this course? Essentially this:

when you are responsible for a task, you will perform that task. When you rely on someone else's work in an aspect of the performance of that task, you will give full credit in the proper, accepted form. Plagiarism is a violation of the honor code.

Accessing material uploaded to study sites by other students to complete an assignment; sharing and uploading any of your own answers or finished work to a third party "study site"; and using ChatGPT to answer assignment questions is also considered an Honor Code violation. No grade is important enough to justify academic misconduct. The Code can be found [here](#). It is your responsibility to see me if you have questions about these policies.

In particular, sharing of instructor created materials, particularly materials relevant to assignments or exams, to public online "study" sites is considered a violation of Mason's Honor Code. It also violates important ethical standards.

Students are required to comply with all university policies. For more information go to <https://universitypolicy.gmu.edu/all-policies/>

Student services: The University provides a range of services to help you succeed academically and you should make use of these if you think they could benefit you.

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.

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.

Students must follow the university policy stating that all sound emitting devices shall be turned off during class unless otherwise authorized by the instructor.

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.

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.

Course Schedule

Lecture			
Date	Topic	Date	Topic
T 01/24	Introduction	R 01/26	Ch. 16: Electrostatics
T 01/31	Ch. 16: Electric Fields	R 02/02	Ch. 17: Electric Potential
T 02/07	Ch. 18: Current	R 02/09	Ch. 18: DC Circuits
T 02/14	Ch. 18: DC Circuits	R 02/16	Ch. 19: Magnetism
T 02/21	Review	R 02/23	Exam 1: Ch. 16, 17, 18
T 02/28	Ch. 19: Magnetism	R 03/02	Ch. 20: Induction
T 03/07	Ch. 22: Electromagnetic Waves	R 03/09	Ch. 22: Electromagnetic Waves
T 03/14	<i>Spring Break</i>	R 03/16	No classes
T 03/21	Ch. 23: Reflection and Refraction	R 03/23	Ch. 23: Reflection and Refraction
T 03/28	Ch. 24: Optical Instruments	R 03/30	Ch. 25: Interference and Diffraction
T 04/04	Ch. 25: Interference and Diffraction	R 04/06	Review
T 04/11	Exam 2: Ch.: 19, 20, 22, 23	R 04/13	Ch. 26: Relativity
T 04/18	Ch. 27: Models of the Atom	R 04/20	Ch. 27: Models of the Atom
T 04/25	Ch. 28: Quantum Physics	R 04/27	Ch. 29: Nuclear Physics
T 05/02	Ch. 29: Nuclear Physics	R 05/04	Wrap-up
	Final Exam	TBA	TBA