

Phys 245-C01: College Physics 2 (3 credits)

Summer 2021



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Office hours: Tuesdays and Thursdays from 1 pm to 2 pm in the Blackboard Collaborate Ultra Room and by appointment

Important Dates:

06/23 Last day to add classes

06/23 Last day to drop classes without penalty

06/29 Last day to drop (50% tuition penalty)

07/07-07/15 Selective withdrawal period

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 electricity, magnetism, optics, relativity, structure of atoms and molecules and finally to quantum mechanics. This course meets GMU's core requirements.

Blackboard Login Instructions

Access to [MyMason](#) and GMU email are required to participate successfully in this course. Please make sure to update your computer and prepare yourself to begin using the online format BEFORE the first day of class. Check [the IT Support Center](#) website. Navigate to [the Student Support page](#) for help and information about Blackboard. In the menu bar to the left you will find all the tools you need to become familiar with for this course. Take time to learn each. Make sure you run a system check a few days before class. Become familiar with the attributes of Blackboard and online learning.

Required Textbooks

OpenStax's College Physics by Urone, Hinrichs, et al. Chapters 18→32 will be covered. This textbook is available at no cost at <https://openstax.org/details/books/college-physics>. The eBook is also integrated in WebAssign. If you want to download a single section or topic, you can do so from WebAssign or from Blackboard.

Course Learning Outcomes

Phys 245 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

Hardware: You will need access to a Windows or Macintosh computer with at least 2 GB of RAM and access to a fast and reliable broadband internet connection (e.g., cable, DSL). A larger screen is recommended for better visibility of course material. You will need speakers or headphones to hear recorded content and a headset with a microphone is recommended for the best experience. For the amount of Hard Disk Space required taking a distance education course, consider and allow for:

1. the storage amount needed to install any additional software and
2. space to store work that you will do for the course.

If you consider the purchase of a new computer, please go to [Patriot Tech](#) to see recommendations.

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. Online courses typically use [Acrobat Reader](#), [Flash](#), [Java](#), and [Windows Media Player](#), [QuickTime](#) and/or [Real Media Player](#). Your computer should be capable of running current versions of those applications. Also, make sure your computer is protected from viruses by downloading the latest version of Symantec Endpoint Protection/Anti-Virus software for free [here](#). Note: If you are using an employer-provided computer or corporate office for class attendance, please verify with your systems administrators that you will be able to install the necessary applications and that system or corporate firewalls do not block access to any sites or media types.

Course-specific Hardware/Software

Hardware or software required for your course or program may be available for purchase at [Patriot Computers](#) (the University's computer store that offers educational discounts and special deals).

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

Webcam: You are required to have a webcam which is either integrated in your computer or attached to your computer. You will need it to be able to take all exams.

Respondus Lockdown Browser: You must install [Respondus Lockdown Browser](#) on your computer before you start an exam.

Google Chrome: You need to download and install google chrome on your computer. Blackboard collaborate ultra will be used for all class sessions and for office hours. It only functions well in google chrome.

Assignments Description

Assignments consist of quizzes which are open book, discussion posts which account for participation, homework which must be completed in WebAssign, two midterm exams and a final exam.

Homework

All homework assignments need to be completed in WebAssign.

WebAssign: (<https://www.webassign.net/login.html>) All assignments will require access to the WebAssign problem solving system. You need to purchase access. There are different levels of access: If you only take Physics 243, you need to buy single term access. If you intend to take Phys243 and Phys245 this summer, then you need to buy multi-term access. Homework assignments on WebAssign count 15%, and the recitation grade counts 10% towards your final grade. The course ID in WebAssign is as follows: **gmu 8695 6031**

Recitation: Students must attend recitation sections for which they are registered. Your recitation instructor will discuss the grade components which will make up your total recitation grade. It is recommended that you do the assigned questions and problems as they are assigned, and organize any of your concerns about applicable principles, formulae and solution schemes for consideration during subsequent recitation periods. Do note that assigned questions and problems will be addressed in the recitation periods according to the schedule.

Exams: The tests and exams in this course will be nominally 40% multiple choice and 60% free-form problems, though the percentages could vary significantly from test-to-test. The multiple-choice 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. The free form problems could any format including multiple-choice, essay questions, fill in the blank etc.

There are no extra credit projects.

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

Exams (2):	40% (20% each)
Homework (WebAssign)	15%
Recitation	10%
Class Participation (quizzes and discussions)	10%
Final Exam	25%

Getting help: In addition to your instructor and your recitation instructor, you have the following resources available to you for help:

Physics Tutor: Dr. Fisher will be available especially Mondays through Thursdays from 10:30 am to 2:30 pm. You can email him anytime but he is also ready to meet you via zoom. Email: sfisher2@gmu.edu

Course Policies

Late Assignments: All assignments must be turned in on the due date.

Instructor-Student Communication: I will respond to your emails within 24 hours. If I will be away from email for more than one day, I will post an announcement in the Blackboard course folder. Before sending an email, please check the following (available on your Blackboard course menu) unless the email is of a personal nature:

1. Syllabus
2. Ask Professor (forum on the discussion board)
3. On-demand Blackboard videos on how to use Blackboard features, and Technical Requirements.

Feel free to respond to other students in the Ask Professor forum if you know the answer.

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

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](#)
- c. **Student services:** The University provides range of services to help you succeed academically and you should make use of these if you think they could benefit you. I also invite you to speak to me (the earlier the better).
- d. 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.
- e. [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 364, 703-993-2380.
- f. 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.
- g. Students must follow the university policy stating that all sound emitting devices shall be turned off during class unless otherwise authorized by the instructor.
- h. [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 Room A114, 703-993-1200. The writing center includes assistance for students for whom English is a second language.

- i. [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			RECITATION
DATE	MATERIAL COVERED	ASSIGNMENTS	PROBLEM COVERAGE
M 06/21	Ch. 18: Charge and Field	2, 6, 10, 12, 16, 28, 41, 46, 48, 54	
T 06/22	Ch. 19: Electric Potential	14, 16, 18, 21, 24, 28, 32, 48, 64, 67	Ch.18, 19 questions & problems as assigned
W 06/23	Ch. 20: Current, resistance	2, 3, 16, 20, 24, 44, 60, 76, 88, 90	
R 06/24	Ch. 21: Circuits	2, 4, 8, 17, 20, 28, 36, 38, 53, 64, 66	Ch. 20, 21 questions & problems as assigned
F 06/25	Ch. 22: Magnetism	5, 8, 12, 20, 35, 44, 51, 84	
M 06/28	Ch. 23: Induction	8, 11, 20, 28, 30, 40, 45,49, 58, 74	
T 06/29	Review		Ch. 22, 23 questions & problems as assigned
W 06/30	Exam 1:	Ch. 18, 19, 20, 21	
R 07/01	Ch. 16: Review Waves	8, 10, 17, 26, 32, 35, 38, 43, 53, 63	
F 07/02	Ch. 24: EM Waves	6, 7, 11, 13, 19, 22, 30, 34	Ch. 16, 24 questions & problems as assigned
M 07/05	Independence Day	No classes	
T 07/06	Ch. 25: Geometric Optics	6, 10, 11, 26, 29, 34, 36, 42, 47, 55	Ch. 25 questions & problems as assigned
W 07/07	Ch. 26: Optical Instruments	none	
R 07/08	Review		
F 07/09	Exam 2:	Ch.: 22, 23, 24, 25, 26	
M 07/12	Ch. 27: Wave Optics	4, 14, 21, 38, 45, 52, 60, 71, 85, 96	
T 07/13	Ch. 28: Relativity	none	Ch. 27 questions & problems as assigned
W 07/14	Ch. 29: Quantum Physics	3, 4, 10, 20, 26, 34, 42, 58, 62, 86	
R 07/15	Ch. 30: Atomic Physics	13, 19, 24, 27, 35, 38, 48, 58	Ch. 29, 30, 31 questions & problems as assigned
F 07/16	Ch. 31: Nuclear Physics	4, 12, 17, 24, 26, 35, 44, 49, 63	
M 07/19	Ch. 32: Applications	none	
T 07/20	Review		Review all chapters
W 07/21	Reading Day		
R 07/22	Reading Day		
F 07/23	Final Exam	Available from 8 am to 11:59 pm	
SAT 07/24	Final Exam (make up day)		

Course Schedule

LECTURE	
DATE	ASSIGNMENTS Due
M 06/21	Quiz 1, Discussion: Introductions
T 06/22	Quiz 2
W 06/23	Quiz 3, HW 1
R 06/24	Quiz 4
F 06/25	Quiz 5, Discussion: Electricity in the Atmosphere, HW 2
M 06/28	Quiz 6, HW 3
T 06/29	
W 06/30	Exam 1, HW 4
R 07/01	Quiz 7
F 07/02	Quiz 8, Discussion: Biological Effects of Electromagnetic Waves, HW 5
M 07/05	No classes
T 07/06	Quiz 9, HW 6
W 07/07	Quiz 10, Discussion: Limitations of Optical Instruments
R 07/08	
F 07/09	Exam 2
SAT 07/10	HW 7
M 07/12	Quiz 11
T 07/13	Quiz 12, HW 8
W 07/14	Quiz 13
R 07/15	Quiz 14, HW 9
F 07/16	Quiz 15
SAT 07/17	HW 10
M 07/19	Discussion: Nuclear Medicine and its role in cancer treatment, HW 11
T 07/20	
W 07/21	HW 12
R 07/22	HW 13
F 07/23	Final Exam
SAT 07/24	Final Exam Make-up day