



PHYS 245: College Physics II

Spring 2022

Instructor:

<p><i>Professor:</i> Dr. Branislav Djordjevic bdjordje@gmu.edu Office: PH 201B Office hours: MWF, 12:00-1:00 pm</p>	<p>Class meets; MWF, 9:30-10:20AM, at LH 1</p>
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Supplementary Resource:

Tutoring Service:

<p><i>Tutor Contact:</i> Shalom Fisher sfisher2@gmu.edu</p> <p>Please contact Shalom Fisher for extra help in learning Physics and to get his tutoring hours this semester.</p>

Intended Audience: This is the second semester in a two-semester, non-calculus physics course intended primarily for students majoring in biology or other sciences, and/or applying to professional school in the health professions. It will not meet the requirements for physics, math, or engineering majors.

Overview: The main topics in this semester will be waves, electricity, magnetism, light, and atomic and nuclear physics. But this course is about more than just physics content; it is about scientific thinking, including developing models, mathematical sense-making, coordinating multiple representations, making interdisciplinary connections, and scientific communication. That is what should stick with you even if you forget all the physics.

This course meets the requirements for **Mason Core Natural Science**. As such, the outcomes of the course include that students will:

- 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 new evidence

- b. is rigorously tested and forms fundamental theories which describe the world
- 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 challenges
 - 4) Evaluate scientific information

Prerequisite: PHYS-243 or equivalent. This course will continue to build on concepts from the first semester (including motion, forces, energy, and oscillations), and will require a similar level of mathematics.

Course Meeting Times:

This is a face-to-face class. The lectures are delivered **MWF, 9:30-10:20 AM, at LH 1**. You can expect to spend about 8-10 hours per week total on this course.

In addition, the lab is a separate course (PHYS246), which you may or may not need to take, depending on your major's requirements. If you are registered for the lab, you will hear separately from your lab instructor about lab meeting times.

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](#) for help and information about Blackboard.

Exam Dates (TENTATIVE!):

Exam 1: Monday, February 21st

Exam 2: Monday, April 4th

FINAL EXAM: Wednesday, May 16th, 7:30 AM – 10:15 AM, the same classroom.

Communication:

If you have a physics question, please email me. I will generally respond within 24 hours.

If you want to discuss something join my office hour, or request a special appointment.

Required materials:

- Textbook: Giancoli, *Physics: Principles with Applications*, 7th edition, (ISBN: 9780321869111)
- MasteringPhysics access code
- Scientific calculator

Textbook: If you took PHYS243 last semester, you should already have the book, and do not have to buy anything new (and you can ignore the rest of this paragraph). Otherwise, the textbook is available (new and used) from the university bookstore and other sources. You can get it as a physical book or as an e-book. Whichever option you choose, make sure it comes with a **Modified** MasteringPhysics access code (this will enable using MasteringPhysics through Blackboard). If you buy the book used, you may have to buy an access code separately.

MasteringPhysics: We will be using the MasteringPhysics system for online homework, and accessing it through Blackboard (so you should NOT go to the MasteringPhysics website). If you have used MasteringPhysics through Blackboard (with this textbook) in the past, then your account should still work and you don't have to do anything else to set it up. If you have used the same textbook for a past course and already have an account through the regular (not "Modified") MasteringPhysics (through the MasteringPhysics website), you will need a new access code for Modified MasteringPhysics (to access through Blackboard). However, you don't need to pay for it again. If you are in this situation, please let me know, and I will request a new (free) code for you from the publisher.

Components of the course:

In class lectures: You are all encouraged to ask questions during my lectures. Your questions make all the difference from semester to semester. So, please, do not hesitate to get

Homework Assignments: Each week there will be several homework problems to do. In MasteringPhysics. Students are encouraged to work in groups, but what you submit should represent your own work.

Recitation: Attendance in recitations is mandatory.

Exams: There will be two exams during the semester and a comprehensive final exam. The final exam will include relatively more material from the last third of the semester, but it will still cover the entire semester. All three exams will count toward your final grade, but the final exam is worth more than the individual exams.

The dates of the exams are shown above. If you have an unavoidable conflict with any of the exam dates, please contact me immediately to make alternate arrangements. If there is an unanticipated emergency that causes you to miss an exam, contact me as soon as possible.

The exams will be administered in the classroom during our regular class meeting. The exams will be open book and open notes. You may consult any notes that you already have in your possession before you begin the exam. You may not communicate with anyone else about the exam during the exam.

While we will strive to minimize this, there is a possibility that there may be some mistakes in the exam grading, or that the grader misunderstands what you are trying to say. If this happens, you may request a regrade. To do this, send a clear explanation of what needs to be regraded and why. In addition to grading error, if you can make a case that you made an early error, but correctly carried out later parts that depended on that error, you can request consistency points. Again, you will have to explain your argument carefully.

The exams are not "curved" but grading scale might change later in the semester.

Grading Scale:	Percentage	Grade
	97	A+
	90	A
	87	B+
	80	B
	77	C+
	70	C
	60	D
	<60	F

Graded assignments weights:

Midterm Exams (15% each) x 2	30 %
Final Exam	20 %
MASTERING PHYSICS Homework (typically due by Sunday midnight. Consult Mastering.)	30 %
Recitation Attendance and ACTIVE Participation	20 %
Total	100 %

Academic integrity: You are expected to observe the GMU Honor Code:

To promote a stronger sense of mutual responsibility, trust, and fairness among all members of the Mason community, and with the desire for greater academic and personal achievement, we, the student members of the university community, have set forth this honor code:

Student members of the George Mason University community pledge not to cheat, plagiarize, steal, or lie in matters related to academic work.

Suspected violations of the Honor Code will be referred to the Office of Academic Integrity. For more information, see <http://oai.gmu.edu>.

Specifically, for this class,

- During the exams, we are trusting you to be honest (and to prepare to uphold the ethical standards of your future profession). Please do not abuse this trust.
- Students are encouraged to form study groups to work on homework assignments and study the course material together. The group is responsible for ensuring that all members take part, learn the material, and understand how to do the assignments and not merely copy the other members' work.

Disability support: All students are entitled to reasonable accommodations to enable them to participate in this class. If you have a disability or other condition that requires accommodation, please contact the Office of Disability Services (<https://ds.gmu.edu>) as soon as possible, and then send me the documentation so that you can receive accommodations.

Diversity and Inclusion: As part of the Mason community and the global physics community, we seek to create a learning environment that fosters respect for people across identities. We welcome and value individuals and their differences including race, economic status, gender expression and identity, sex, sexual

orientation, ethnicity, national origin, first language, religion, age, and disability.

COVID-19: We realize that we are not living in normal times. Please, wear a mask at all times indoors. We all seek to support one another during this difficult time.

The assignments in this class have rigidly set due dates, in order to help keep you on track so that you don't leave everything to the very end. However, we recognize that life circumstances may not make it possible to keep to this schedule. If at any point you need to complete assignments on a modified schedule, please contact me and we can make other arrangements.

Student resources: For complete information and links to student support resources on campus, visit <https://stearnscenter.gmu.edu/knowledge-center/knowning-mason-students/student-support-resources-on-campus/>

In particular, please be aware of:

- **Keep Learning, Learning Services** (learningservices.gmu.edu/keeplearning/)
- **University Libraries** (library.gmu.edu)
- **Writing Center** (writingcenter.gmu.edu)
- **Counseling and Psychological Services** (caps.gmu.edu)
- **Student Support and Advocacy Center** (ssac.gmu.edu)

CLASS SCHEDULE (schedule subject to change) next page

	WEEK OF...	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
Week 1	Jan 23, 2022					
	Ch. 16 Electric Charge and Field	Introduction Math Review vector algebra		Ch.16. 1-5		Ch. 16. 7-9
Week 2	Jan 30, 2022					
	Ch. 17—Electric Potential	Ch.16. 6		Ch. 17. 1-5		Ch. 17. 7-9
Week 3	Feb 6	Feb 7 Last day to withdraw with 100% tuition refund				
	Ch. 18, 19—Electric Circuits	Ch. 18.1-6		Ch. 19.1-2, Ch. 19.5		Ch.18.10, Ch. 19.4
Week 4	Feb 13					
	Ch. 19—DC Circuits	Ch. 19.3		Ch. 19.6-8		Summarize Electricity and Electric Circuits
Week 5	Feb 20					
	Ch. 20—Magnetism	Exam 1 (Chapter 16, 17, 18, 19)		Ch. 20.1-7		Ch. 20. 11-12
Week 6	Feb 27		Mar 1			
	Ch. 21—Electromagnetism	Ch. 21.1-3	Withdrawal period ends	Ch. 21. 4-5		Ch. 21. 7-9
Week 7	Mar 6					
	Oscillations & Waves	Review of Oscillations Ch. 11.1-3		Review of Oscillations Ch. 11.7-8, 11-12		Ch. 22.1-5
	Mar 14 - Mar 20, 2022	Spring Break				
Week 8	Mar 20					
	Ch. 12—Sound	Ch. 12.1-4		Ch. 12.5-7		Ch. 12.8-9
Week 9	Mar 27					
	Ch. 24—Wave Nature of Light	Ch. 24. 1-4		Ch. 24.5-6, 10;		Ch. 22.7, Ch. 24.7
Week 10	Apr 3					
	Geometric and Optical Instruments Part 1	Exam 2 (Chapters 20, 21, 12, 22, 24)		Ch. 23. 1-3		Ch. 23. 4-6
Week 11	Apr 10					
	Geometric and Optical Instruments Part 2	Ch. 23. 7-8		Ch. 25. 1-3, 9		Ch. Ch. 25. 4-6
Week 12	Apr 17					
	Ch. 27—Early Quantum	Ch. 27. 1-3		Ch. 27. 6-9		Ch. 27. 10-12
Week 13	Apr 24					
	Ch. 28—Atomic Physics	Ch 28. 1-4		Ch. 28. 5-8		Ch. 30. 1-6
Week 14	May 1					May 6 Last day of PHYS 245 classes
	(Ch. 30—Radioactivity) + (Ch. 31—Effects of Radiation)	Ch. 30. 7-11		Ch. 31. 1-5		Ch. 31.9

FINAL EXAM: Wednesday, May 16th, 7:30 AM – 10:15 AM, the same classroom.