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

Spring 2021

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Office hours: By appointment

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.

Required Textbooks

Giancoli, Physics with Applications, 7th Edition, Chapters 16-31

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.

Software: This course uses Blackboard as the learning management system and Mastering Physics for homework. 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. Also, make sure your computer is protected from viruses by updating your virus software.

Course-specific Hardware/Software

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 Mastering Physics, two midterm exams and a final exam.

Homework

All homework assignments need to be completed in Mastering Physics.
The course ID is as follows: **belle44500**

Exams

The tests and exams in this course will be nominally 40% concept based multiple choice questions and 60% free-form problems, though the percentages could vary significantly from test-to-test. 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 have 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 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%
Reading Quizzes	10%
Class Participation (discussions)	5%
Final Exam	30%

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)

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.

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. 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.

g. 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	**MATERIAL COVERED**	**DATE**	**MATERIAL COVERED**
T 01/26	Ch. 16: Electrostatics	R 01/28	Ch. 16: Electric Fields
T 02/02	Ch. 17: Electric Potential	R 02/04	Ch. 17: Electric Potential
T 02/09	Ch. 18: Current	R 02/11	Ch. 19: DC Circuits
T 02/16	Ch. 19: DC Circuits	R 02/18	**Review**
T 02/23	**Exam 1: Ch: 16,17, 18, 19**	R 02/25	Ch. 20: Magnetism
T 03/02	Ch. 20: Magnetism	R 03/04	Ch. 21: Induction
T 03/09	Ch. 22: Electromagnetic Waves	R 03/11	Ch. 22: Electromagnetic Waves
T 03/16	Ch. 23: Geometric Optics	R 03/18	Ch. 23: Geometric Optics
T 03/23	Ch. 24: Wave Optics	R 03/25	Ch. 24: Wave Optics
T 03/30	Ch.25: Optical Instruments	R 04/01	**Review**
T 04/06	**Exam 2: Ch: 20, 21, 22, 23, 24**	R 04/08	Ch. 26: Relativity
T 04/13	Ch. 27: Models of the Atom	R 04/15	Ch. 27: Models of the Atom
T 04/20	Ch. 28: Quantum Mechanics	R 04/22	Ch. 29: Molecules and Solids
T 04/27	Ch. 30: Nuclear Physics	R 04/29	Ch. 31: Nuclear Energy
	Final Exam	**R 05/06**	**Asynchronous**