

University Physics II – Spring 2005

PHYS-210/210G

Instructor and Lab Instructor:

Asst. Prof. Nathan L. Harshman

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American University**Email:** harshman@american.edu**Phone:** (202) 885-3479**Office:** McKinley 100**Classroom:** McKinley 108**Lab room:** McKinley 14**Class meeting times:** Tuesday and Friday, 9:55-11:10am**Office hours:** Tuesday 1–3pm, Wednesday 3-5pm, Thursday 3-5pm, or by appointment**Grader:** Scott Moerschbacher

Office hours: TBA

Office: TBA, check at front office of CAP Dept.

The focus of this course is electromagnetism, waves, optics and relativity. The electromagnetic interaction is responsible for most chemical and physical phenomena with which we are familiar except for gravity. Its basic principles underlay the working of all modern technology. As a theory, it gives a unified description of all electric, magnetic and optical phenomena. We will also have fun at the end of the semester exploring Einstein's special relativity.

A secondary goal of the class is to encourage critical scientific thinking. To that end, the course will provide many experiences where understanding and progress can only be made by combining theoretical insights with real-world experiments or practical knowledge. The wonder and utility of science is that it fulfills three roles: it predicts, describes and explains. Physics relationship to other sciences and its social and historical context will not be ignored.

A final goal of the course is to provide ample experience in problem-solving, one of the most important tools, not just for science, but also for life. Qualitative and quantitative methods of problem solving will be explored and practiced in the context of physics.

The course requires credit for a first semester introductory calculus class, such as MATH-221, and credit for an introductory, (typically calculus-based) introductory physics class, such as PHYS-110/110G.

General Education Information: UP II is one of nine second-level courses in Curricular Area 5-The Natural Sciences, Cluster Two: The Physical World in the University's General Education Program. This course is the second of a two-course sequence and most people will have taken the prerequisite PHYS-110G. Additionally, General Education credit will be given only if the prerequisite Foundation course has been taken for this course. Prerequisite Foundation courses are CHEM-100G, CHEM 105G, PHYS-100G, PHYS-105G or PHYS 110G.

Course Materials:**Text:** *Physics for Scientists and Engineers*, Randall D. Knight, Pearson-Addison Wesley**Supplemental Material:** At the bookstore, it comes bundled with the Student Workbook and an access code to Mastering Physics**Laboratory manual:** On sale at campus bookstore**Calculator:** Scientific calculator that can do trigonometric, exponential, and logarithmic functions; graphing capacity not required; graphing capabilities cannot be used during in-class tests.

Communication: This course will use the Blackboard system of American University for distribution of information outside of class time.

Email: You must have an American University email account to use this system; if you use an email provider other than American, forward your American mail to that account. On-line quizzes will be taken through Blackboard, on-line discussion sessions will be managed through Blackboard, and solutions to homework and tests will be posted on Blackboard. Check your email and the class website of Blackboard frequently to stay up-to-date. I usually respond fairly promptly to email and it is my preferred method of communication outside of class and office hours.

Discussion Boards: Please make use of the discussion boards to ask questions, vent frustrations, share neat ideas or websites, etc.

Privacy: For the record, I can track Blackboard viewing, i.e. count the hits on each page and see who accessed it. However, you can post on the discussion board anonymously, and I really can't see you said it.

Etiquette: Express yourself freely in this class, in email and on Blackboard. However, be respectful and polite to your fellow students.

Course requirements and grading: Your final grade will be based on the following:

Warm-up quizzes	10%
Practice Problems	5%
Lab grade	15%
Homework	20%
Class Participation	5%
Test 1	15%
Test 2	15%
Final	15%

Grading scale: Your grades and the class average grades will be released periodically throughout the semester. Students at risk for receiving a C- or lower will be notified midway through the semester. The grading scale below is guaranteed to be the maximum requirements for a grade, but may be adjusted lower to account for class performance.

A	>	93%
A-	>	90%
B+	>	87%
B	>	83%
B-	>	80%
C+	>	75%
C	>	65%
C-	>	60%
D	>	45%

Warm-up quizzes: Thirteen times during the semester, on-line warm-up quizzes will be made available over Blackboard, roughly one each week due on Tuesday (see Schedule). These quizzes cover concepts in the reading assignment due for the next class, i.e. they cover material that will be discussed in class AFTER the quiz is due. As a result, the quizzes will be graded for effort and thoroughness. (You can get a perfect score even if you don't know what you are doing as long as you show effort!) Typically, the warm-up quiz will be available on-line for 24 hours, starting at 8 AM the day before class and ending at 8 AM the day of class. Your responses to the warm-up quiz will help shape what happens in the following class. You may use your book and notes to help you answer the questions but you must work alone. Any communication about the quiz with other students about the content of or the answers to the quiz is a violation of the Academic

Integrity Code (AIC) (see below). There are no acceptable excuses for missing a quiz, but only the best eleven will be included in your grade.

Practice Problems: Eleven times during the week you will be responsible for going to the website at www.masteringphysics.com and completing one or two practice problems. Click on the Knight book cover (second from left) and then click on the “Register” button. Use the access code that came with your new book (last semester for many of you) to register. If you bought your book used or did not buy it in the bookstore bundle, you may have to buy access to the website separately. You will then be able to set up your own unique ID and password codes to allow you access to the site all semester. You will also need to enter our course ID when you register. Our course ID is PHYS210HARSHMAN05. You will find documentation on how to use this software in more detail on our Blackboard site. This portion of your weekly homework assignment is automatically scored as you complete it. Note: the first homework “Introduction to MasteringPhysics” won’t be graded, but you can replace one practice problem by completing it.

Laboratories: Ten times during the semester you will meet during the laboratory time in McKinley 14 to perform experiments. Three times during the semester (before tests) you will meet for a Review Lab, where we will review material for the test. Your exact lab meeting time is determined by your course section. You are expected to have read the section in the laboratory manual about that week’s experiment before you arrive. Grades for laboratory activities for each normal session will be assigned on the basis of experimental write-ups, pop quizzes, worksheets, and group activities. There will be no lab make-ups, but you will be allowed to drop one grade.

Homework: Eleven times during the semester assigned homework will be required to be turned in. The homework assignments will be posted on Blackboard at least one week before the due date. You may work with others to complete these assignments, but you must turn in your own work. I will explain the format for the homework that is required. This is a super-important part of your grade! You may not copy the homework from someone else, as that is a violation of the AIC. You are encouraged to attempt all the homework on your own before seeking assistance, as that will provide the greatest practice for the tests. Optional Supplemental Instruction sessions (see below) will be held weekly with a teaching assistant to help you complete this assignment. The homework will be due in class on Fridays with no extensions possible except for excused absences (see below). Only your best nine homework assignments will count towards your grade.

Class Participation: To receive the full 5% for class participation, you must receive 80 marks. Possible ways of getting a mark are described below.

Attending a full class (start to finish)	2 marks
Attending a class (but getting there late or leaving early)	1 mark
Asking a constructive question in class (self-awarded)	1 mark
Helping with an in-class demonstration (self-awarded)	1 mark
Visiting office hours	1 mark
Your answer from WU used in class (self-awarded)	1 mark
Contributing to an on-line discussion board	1 mark
Completing a survey	5 marks

Tests and Final: There will be two tests and a final during the final exam period. They will be closed-notes and closed-book and will consist of multiple-choice questions, short written answers and free-response problems. Test 2 and the final are both cumulative. Test results and answer keys will be posted on Blackboard.

Regrades: If you feel homework or a test has been misgraded, DO NOT WRITE on it. Write a note on a separate piece of paper and give it to me in class or office hours or slip it in my mailbox in McKinley 102 within one week of the date it was returned. The assignment will be regraded more carefully. Note: your grade may go up OR down based on the regrade. That’s the chance you take for me looking at it more carefully.

Succeeding in this class and getting help: To succeed in this class, it is imperative that you interact with the material every day. Physics is like a foreign language, you cannot learn it just from attending class. Make sure you do the readings before class and lab, do all the warm-up quizzes and homework, solve the sample test questions, attend SI sessions, come to office hours. This is a four-hour class, so you should spend *at least* eight hours a week outside of class time thinking about and practicing physics.

On-line discussions: On Blackboard there will be on-line discussion groups. You can use this to ask me questions publicly, discuss homework with your peers and voice concerns and opinions about the material and the class.

Supplemental Instruction (SI) sessions: SI is group tutoring, offered twice a week, facilitated by a fellow student who has done well in the class in the past. SI will complement what you are learning in class by providing strategies for learning the material, clarifying concepts and generally acting as a guide to help build your understanding of and confidence in the class. It's also a good place to get homework help. It is voluntary and confidential and has a good track record as a program that helps students succeed in difficult courses.

Other Blackboard resources: Lots of other good stuff will be on our course's Blackboard site. Check it out regularly.

Office hours: You are super-welcome to come to office hours. We have a good time there. If you can't make any of the times listed above, call or email me, and we can work something out. The grader will also have office hours about once every week.

Students with disabilities: You should be registered with the University, who will send me a letter describing your special needs. We can accommodate your needs, but occasionally patience will be required.

Academic Integrity Code: Read it and follow it. It is your responsibility to know it and abide by it. Follow all instruction given here or given on a specific assignment or the full due process of the AIC will come down on you.

Excused absences and extensions: Severe illness, religious observance, University business, and family emergency are acceptable reasons for missing class or needing an extension on an assignment. I have the right to request reasonable documentation, in accordance with University policy. Do not notify me of an absence, such as missing an exam or needing an extension, at the last minute. Use email and notify as far in advance as possible. I will be strict about this.