

University Physics II – Spring 2007

PHYS-210

Sections 001H, 002, 003, 004, 005, 006, 007, 009H

Asst. Prof. Nathan L. Harshman

Department of Computer Science, Audio Technology, and Physics
American University

Email: harshman@american.edu	Classroom:	McKinley 108
Phone: (202) 885-3479	Lab room:	McKinley 14
Office: McKinley 160	Class meeting times:	TF 9:55 AM - 11:10 AM (1H, 2, 3 and 6) TF 11:20 AM - 12:35 PM (4, 5, 7 and 9H)

Office hours: M 2-4 PM, TH 3-5 PM, F 1:30-3:30 PM, or by appointment

Lab Instructors:

Sections 001H and 009H: Bill Parsons

Email: parsonsfamily@starpower.net

Phone: (240) 620-3170

Office: McKinley 7

Office Hours: W 10AM – 4PM, F 10AM - 2PM, and by appointment

Sections 002-007: Soudabeh Nayeri

Email: nayeri@american.edu

Phone: (202) 885-2757

Office: McKinley 3

Office Hours: TBA

Supplemental Instruction Leader:

Adam Goler

Email: adamgoler@gmail.com

SI Sessions: TBA

SI Room: TBA

General Education Faculty Assistance Program (GEFAP) Assistant:

Seth Reuter

Email: seth.reuter@american.edu

Tutorial Sessions: TBA

Tutorial Room: TBA

Course Goals: University Physics (UP) II is the second part of a two-semester introduction to many topics in classical physics. The most important goal of this class then will be to survey some of the topics of waves, optics, electromagnetism, and circuits. This overview will focus both on the conceptual interplay between different physical aspects and on the mathematical language that can be used to describe these relationships. Also, the technological applications of these topics will be explored.

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 and 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.

Throughout history, scientific discoveries have influenced theories of philosophy, society, government, religion, and every other mode of human self-exploration. Another goal of this class is to present some of the intersections between physics and modern thought.

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.

Student Expectations: This class will not be conducted in the traditional manner of science courses. There will be very little lecturing to introduce new material. Instead, it will be assumed that the students come to class prepared. You should come to class having completed the reading assignment and pre-class activity. Then, most of class time will be spent trying to apply and synthesize the recently acquired knowledge. This will be achieved through peer instruction techniques using personal response pads

("zappers"), demonstrations, and other in-class activities to practice conceptual thinking and problem-solving skills. Some lecturing will occur, but these will generally push the material beyond the book. As a result, attendance will be crucially important to success.

To further develop skills, there will be eleven homework sets due over the course of the semester. These are meant to give the student practice problem-solving. While problem-solving skills will be taught in class and are discussed in the textbook, the only way to become a good problem-solver is practice. Students are strongly encouraged to work collaboratively on these assignments, however do not rely on peers to solve everything or you will not develop the skills to do well on tests and in future solo endeavors.

Additionally, there will be a laboratory for you to practice skills and concepts of the course while developing experimental intuition. See the lab instructor's syllabus for details..

Motto for success: Do a little physics everyday!

Requirements: 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.

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-110. Additionally, General Education credit will be given only if the prerequisite Foundation course has been taken for this course. Prerequisite Foundation courses are CHEM-100, CHEM 105, PHYS-100, PHYS-105 or PHYS 110.

Course Materials:

Text: *Physics for Scientists and Engineers*, Randall D. Knight, Pearson-Addison Wesley

Supplemental Material: At the bookstore, the textbook comes bundled with the Student Workbook. You should use this—it is very helpful and answers will be available—but it is not required.

MasteringPhysics: We will be using this website to host our on-line pre-class warm-up activities. This software takes a little getting used to, but I have found that students really like it once they have figured it out. To register, follow the link in the Assignments section of Blackboard. To enroll, use the course ID: **MPHARSHMAN89317**. If you bought a new textbook, it came with an insert that has your enrollment code. Otherwise, you will have to purchase enrollment rights. Use your student ID for your enrollment. You should try to enroll today; don't put it off until tomorrow! Contact me or come to my office hours if you need help.

Laboratory manual: On sale at campus bookstore. You will need it for the first lab on 17 Jan or 18 Jan.

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:

Pre-class, warm-up activities	10%
Lab grade	20%
Class Participation and surveys	5%
Homework	30%
Exam 1	10%
Exam 2	10%
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 Activities: Sixteen times during the semester, pre-class activities will be made available through the MasteringPhysics website (see Schedule). These cover concepts in the reading assignment due for the next class, i.e. they cover material that will be discussed in class AFTER the activity has been completed. The pre-class activity will be available until 9:30 AM the day of class. You may use your book and notes to help you answer the questions and you may work with other students, but everyone must complete the activity for themselves. There are no acceptable excuses for missing a pre-class activity, but only the best fourteen will be included in your grade. There is also an optional WU0 which you can take as a tutorial. If you complete it, it can replace a missed WU. There is no credit for a late WU.

Laboratories: Eleven times during the semester you will meet during the laboratory time in McKinley 14 to perform experiments. 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. Each week that the lab meets you will complete a laboratory report for that experiment to be turned in the following week to the lab instructor. If you miss a lab for an unexcused reason (see below), it is at the discretion of the laboratory instructor to allow you to make it up on a later date. Occasionally the material covered in the experiment for the week will lead the lecture; this is normal.

Class Participation: To get the full 5% of class participation you need to accumulate 80 checks over the course of the semester. Each regular class, you will receive one check for being on time and one check for attempting all zipper questions. Additionally, you receive additional checks when you attend office hours, take surveys, or post on the discussion board. Finally, if you believe you have contributed to class discussions, you can self-award a check after each class.

Surveys: There will be three surveys during the semester. The Pre-Class Survey and End-of-Semester Survey will be at the Galileo website. See instructions on Blackboard. The Mid-Semester Survey will be on Blackboard. Please take these surveys, as they will be used to shape the course structure and content. Each survey will also count as 5 checks.

Homework: Eleven times during the semester assigned homework will be required to be turned in using MasteringPhysics. You may work with others to complete these assignments, but you must turn in your own work. This is a very 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 tutorial sessions and GEFAP tutorial sessions (see below) will be held several times a week with a teaching assistant to help you complete this assignment. The homework assignments will be due at 9:00 AM on the due date for full credit, and each day late reduces the credit by 25%. Only your best ten homework assignments will count towards your grade.

Exams and Final: There will be two written tests during the semester and a final during the final exam period. The written exam and the final will be closed-notes and closed-book and will consist of multiple-choice questions, short written answers and free-response problems. Sample test questions (a mock test) will be provided before each exam. The final is cumulative. Test results and answer keys will be posted on Blackboard. Typically, the test averages are around 60%. This is normal.

Re-grades: 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 re-graded more carefully by me. 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.

SI and GEFAP tutorial 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. A GEFAP assistant will also run similar tutorial sessions.

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.

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.

Other weird things:

- If class is cancelled for any reason, including snow, you are still responsible for that material even though we will not cover it in lecture.
- Your parents, friends, prospective students, etc. are welcome any non-test day in class (as long as they are not disruptive). I appreciate prior notice, but I do not need it.