
Physics 126 Spring 2008

<http://www.owl.net.rice.edu/~phys126>

Welcome to Phys 126!

This term you are in for many surprises. The first is that this class is not simply about memorizing formulas or clever algebra solutions. Sure, we'll do some of that, but there's more. The topics covered during this course will touch on several areas of human knowledge and interest, from light to electrical circuits, and the skills you will develop will focus on critical thinking. The most important thing you will learn, however is an appreciation for the way the world around us works – and a sense of wonder for what we've discovered about it.

1 Instructors

1.1 Lecture

Instructor:	Prof Sarah Nagel	Prof Gordon Mutchler
Office Hours:	T, Th 10:45 am-12 pm T,Th 2-4 pm by appointment any time the door is open	M 2 pm- 4 pm W 10 am - 12 pm by appointment
Contact:	113A Herzstein Hall nagel@rice.edu x5727	229A Herman Brown Hall mutchler@rice.edu x5315

1.2 Laboratory

Instructor:	Professor Stan Dodds
Contact:	109 Herzstein Hall dodds@rice.edu x2510

Office hours are an excellent resource for you, the student. But they are also indispensable to us as your instructors. While you get help on the class, we get feedback on how our students are doing with the material. Therefore, we expect to see you there!

2 Venues and Activities

2.1 Class Meetings

Herzstein Physics and Astronomy Amphitheater
Tu, Th 9:25 am- 10:40 am

The class is large. No kidding. But despite this rather obvious fact, our class periods have been designed to have an interactive feel. The goal of class time is to introduce topics not in the text, emphasize ones that are in the text, and highlight common conceptual and problem-solving pitfalls. It is our responsibility to present this material for you coherently and create an environment in which you feel comfortable participating. It is your responsibility to take us up on our offer to participate and to prepare yourself for class by reading the material and working the sample problems. So fight the urge to sink below the sea of your classmates, . . . our collective success depends on it!

2.2 Help Sessions

Herzstein 117-122
Time: TBA

Throughout the week an instructor or a teaching assistant will lead optional two-hour meetings designed to assist students in forming problem solving skills. Recitation leaders will not lecture, but will instead coach small groups of students in how to approach problems.

Herman Brown Hall 223
F 2 pm- 5 pm Prof. Mutchler will be available for reviews and help sessions most weeks. If he is not available due to travel or other commitments, this will be posted on the course web page. You are welcome to come and ask questions about the course material or ask for reviews of particular aspects of the course.

2.3 Lab

The laboratory portion meets 9 times over the course of the semester. Your lab meeting time will be posted on Friday, January 11 , after compiling student preferences. You should submit your preference form by 5:00pm on Thursday, January 10, to Stan Dodds in HZ 109. The form will be given to you in class and may also be found in the Labs portion of the web site.

Though your lab instructor will make clear the expectations for the laboratory portion of the course, note that you are expected to prepare for the labs in advance (including the first lab) and will have a short pre-lab quiz at the beginning of each lab.

3 Nuts and Bolts

This is where we talk about materials, your grade, and the honor code. Make sure you understand this section, and if you have any questions, please let me know.

3.1 Materials

The materials listed below are necessary for you to complete the course. Supplemental material may be found in the student workbook and on the website affiliated with the text.

Textbook	Knight, Randall D., <i>Physics for Scientists and Engineers with modern physics: A Strategic Approach</i> . Addison Wesley
Calculator	The most advanced features youll need are logarithms and trigonometric functions. That being said, don't pitch your \$200 calculator.
Web Access	Youll need the web to access homework sets, solutions, course information, announcements, and to access OWL-Space.

3.2 Your Grade

Your success in this course will depend on several factors, including your attendance, your focus, prior experience, and the time spent on the course. Your *grade* is based on performance on class exams and assignments.

Nota Bene: The author of your book has gone to great lengths to make the text highly readable. My first request is that you do read it. That simple act, plus studying the questions and discussing them with your fellow students, practically guarantees you a good grade. Reading the assignment before each class is better than reading it after, and certainly is better than waiting until just before the exam (duh!).

Grade Breakdown

Laboratory	15%
Homework	20%
Exams	45%
Final Exam	20%
Subtotal	100%
Class Participation	×1.02

Grade Assignments: these are the minimum grades you are guaranteed.

Cut-off	Minimum Grade
90%	A-
80%	B-
70%	C-
60%	D-
All grades below 60%	F

3.2.1 Laboratory 15%

The laboratory portion of the course is both significant and important. You should gain appreciation for the empirical nature of physical science and experience testing its relationships. Your grade will be determined by Prof. Stan Dodds and your individual lab instructor.

3.2.2 Homework 20%

Your homework grade will be based on weekly homework assignments taken from the text, handed out in class, or posted on the course web page. A typical assignment will involve a 3-stage scheme. Stage 1 Stage 1 will consist of 5-8 problems. Five problems will be chosen randomly to be graded for completion. Each problem will receive either a 0 for no attempt, a 1 for a misguided attempt, or a 2 for a reasoned attempt; this stage is worth 10 points.

Stage 2 Stage 2 will consist of a pledge problem, graded for process and accuracy worth ten points.

Stage 3 Stage 3 will consist of a test-preparation problem graded for process and accuracy, worth ten points.

Stage 0 There is also a stage 0 problem set which consists of suggested problems that are of the "plug and chug" variety. Their aim is to familiarize you with the very basics and get you started in the right direction. Additional practice problems are also included. This part of the homework is optional and is worth no points.

Typical Homework Assignment

Stage 0	a few simple problems	0 points
Stage 1	5 out of 5 ~10 completion problems	10 points
Stage 2	1 pledge problem	10 points.
Stage 3	1 test-preparation problem	10 points.
Total		30 points

Half Homework Assignment

Stage 0	a few simple problems	0 points
Stage 1	2 of 2~ 5 completion problems	5 points
Stage 2	1 pledge problem	10 points.
Total		15 points

There will be a total of 12 homework assignments, of which two will be half-assignments due to weeks shortened by exams or holidays. This gives a total of 330 points.

Homework is to be turned into the PHYS 125/126 box inside Herzstein 102. Assignments are due at 9:20am unless otherwise noted on this syllabus or the assignment itself.

3.2.3 Feedback Fliers *Bonus*

During the course of each class meeting, you will be asked to give feedback on the material: sometimes a sketch, a simple problem, or even short answer questions. Fear not! These points can only help you. There will be 24 quizzes over the course of the semester, each worth roughly 2 points towards your homework grade. That is, all the points you earn taking quizzes will be added directly to your homework grade. The caveat is that the maximum score for your total homework grade is still 100%.

To receive full credit on a flier you must answer the questions correctly – even if you don't answer the questions, however, please submit the flier so that your attendance may be noted.

3.2.4 Exams 45 %

The three midterm exams are the single most significant portion of your grade, with each exam counting 15 %. These exams will be held on Tuesdays at 8 am. The locations for these exams are HZ AMP, HZ 210, and HZ 212. You will be notified prior to the exam where you should take the test.

You will have a full class period, 75 minutes, to take the exam, but no more. The instructors reserve the right to deduct points from any exams not turned in when due. The format of these exams will be discussed at least one week prior to the first exam. One of the most important parts of preparing for an exam is getting a decent amount of sleep the night before. No joke.

3.2.5 Final Exam 20 %

The final exam will be held during the regularly scheduled weeks for Rice University final exams. You will be notified of the time and place as we near the end of the course. The final exam will be cumulative, as each of the midterm exams are, but will differ in that it be a much more balanced representation of the whole course material.

3.2.6 Attendance *Bonus*

We will not penalize a student for poor attendance. In that case, the grade usually begins to suffer on its own. However, we would like to reward those that show a heroic amount of effort for attendance. That is, any student that misses no more than two class days will receive a multiplicative factor of 1.02 to their final course grade. Grade cutoffs will be applied before the bonus so that no student is adversely affected by the attendance policy. We will not distinguish between excuses, as this is simply a reward.

3.3 Policies

This section includes course policies, and has been divided into three sections: honor code, regrades, disabilities, and an additional policy regarding case-by-case rulings.

3.3.1 Honor Code

This section includes information on the honor code as it applies to each portion of the course:

Laboratory

These guidelines will be set out by Prof. Dodds and your lab instructor.

Homework

Stages 0 and 1 We encourage all of you to work together on these homework problems as much as it helps you gain understanding. This includes taking advantage of office hours and the help sessions. While many think that there is a gray area here, there is not. There is a clear distinction between working together and turning in someone else's work as your own. Discussing problems, how to set them up, and the concepts involved are all productive ways to make progress in your understanding of physics. However, providing your own work for copying or copying someone else's work is clearly academic dishonesty.

Stage 2 Part of the weekly homework assignment will include a pledge problem that will help you synthesize the conceptual with the calculation. This problem is to be worked on your own and without the aid of anyone else. You may use your text and any class notes you have. If you have

questions about the problems, they should be directed to Sarah or Gordon.

Stage 3 Typical assignments will also include a test-preparation problem that will help you gauge your understanding of the course material. This will be similar to a Stage 1 problem, but it is to be worked on your own and with no outside aid except for the provided formula sheet. The time limit will be specified on the assignment.

The homework pledge is

On my honor, I have neither given nor received any unauthorized aid on this homework assignment.

Feedback Fliers

Since you can't really have someone participate for you, you should complete these quizzes on your own with only your book as an aid.

Exams

Exams must be completed within the allotted time and with no outside assistance. Instructors will periodically enter the classroom, and you are permitted to ask questions of them. However, remember that your instructors are limited in the amount of information they can give. There should be no communication with any other persons (verbal, electronic, etc.) other than the instructors. The use of calculators on the exam is permitted, but is limited to calculation. Any other uses (unit conversion, formulas, graphing, etc.) are not allowed. You will also include a copy of the honor pledge on your exam: *On my honor, I have neither given nor received any unauthorized aid on this exam.*

Class Attendance

Class attendance will be measured with a combination of daily quizzes and your responses with the infrared Personal Response System. You are not allowed to pick-up, fill-out, or turn-in a paper for anyone else, nor are you allowed to make PRS submissions for another student. Furthermore, you must arrive on time to receive credit for attending class.

Late Policy

No late policy exists for exams and flyers where the deadlines are firm. Laboratory late policies will be set by Prof. Dodds and your lab instructor. For homework the late policy is the "One minute - One Week rule":

Items turned in one minute after the assignment is due but before one week after it was due will receive half credit. Items turned in after one week from the time the assignment was due will receive no credit.

Exceptions to this rule and opportunities for make-up work are extremely rare. The exceptions are on a case-by-case basis. It is more advantageous to the student to discuss these situations with the instructor in person or by e-mail in advance. If the nature of the circumstance prevents advanced notice, it is in the students best interest to discuss it with the instructor as soon as possible.

3.3.2 Regrades and Appeals

All appeals to the instructors for a regrade must be made within a week from the date that the exam or homework was returned. Note that the whole assignment will be reviewed.

3.3.3 Students with Disabilities

Any student with a documented disability needing academic adjustments or accommodations is requested to speak with us during the first two weeks of class. All discussions will remain confidential. Students with disabilities should also contact Disability Support Services in the Ley Student Center.

3.3.4 Adopted from MLB Rule 9.01(c)

Each instructor has authority to rule on any point not specifically covered in this syllabus.

4 Tentative Schedule

Week	Material covered	Reading	Lab	Due Dates
01/07	Introduction, Wave Review	Chapters 20-21		
01/14	Wave Optics	Chapter 22		HW #1-half due 01/15
01/21	Ray Optics	Chapter 23		HW #2 due 01/22
01/28	EXAM 1 (22-23), Electric Charges and Forces	Chapter 25		HW #3 due 01/31
02/04	Electric Field	Chapters 25-26		HW #4-half due 02/05
02/11	Current and Conductivity	Chapters 26,28		HW #5 due 02/12
02/18	Electric Potential	Chapter 29		HW #6 due 02/19
02/25	EXAM 2(25,26,28,29), Potential and Field	Chapter 30		HW #7 due 02/28
03/03	<i>Midterm Break</i>			
03/10	Fundamentals of Circuits	Chapters 30-31	no lab	no assignment
03/17	Magnetic Field	Chapters 31-32		HW #8 due 3/18
03/24	Electromagnetic Induction	Chapters 32-33		HW #9 due 03/25
03/31	Gauss's Law	ChAPTERS 33,27	no lab	HW #10 due 04/01
04/07	EXAM 3 (30-33), EM fields and waves	Chapter 27		no assignment
04/14	Modern Optics and Matter Waves	Chapter 34, 24	no lab	HW # 11 due 04/15
04/21	Nuclear Physics? may cover other material	Chapters 24,42	no lab	HW # 12 due 04/22