

Physics 2010 Syllabus (Spring 2008)

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1 Introduction

Welcome to Physics 2010! I hope that you enjoy studying physics, and that you fulfill your goals for this class. I love studying and learning about physical phenomena in the natural world, and I hope to share with you some of the wonder and excitement the study of physics gives me. In this syllabus, I will outline my personal teaching approach, what I intend to cover in this course, and my goals for the semester. I'll discuss how I expect to spend our time in class, and how your grade will be determined. I'll end with some miscellaneous notes and listings of homework, quiz, and exam schedules.

1.1 Philosophy

When I was a physics student, I spent a **lot** of time learning how to be a physics “mechanic”. Most of that effort was dedicated to learning to “plug and chug” through the sometimes quite difficult and rigorous mathematics often associated with physical models. Although this is a vital, even critical skill required of a practicing scientist, at times my conceptual understanding of physics suffered a bit.

My first priority in this class is to emphasize a conceptual understanding of physics and to train you how to think critically and analytically about physical phenomena. My intent is not to make you into a machine that can regurgitate formulae for any applicable situation. Rather, my hope is that you learn how to apply basic principles to solve problems in an analytically rigorous fashion.

1.2 Course outline

We will be studying primarily the principles of Newtonian mechanics and dynamics (including gravitation) as applied to everyday objects. We will then extend these principles in the study of fluids and gases, ending the course with an introduction to the principles of thermodynamics, wave motion and sound. Our text for this course is *College Physics*, 2nd. Edition, by Paul Peter Urone, published by Brooks/Cole (ISBN: 0-534-37688-6). We will be studying chapters 1-16 in the text.

1.3 Instructor goals

Here is what I hope that you learn in this class:

- How to estimate solutions to analytical questions.
- How to apply the principles of physics you learn in class to everyday situations.
- How to analyze problems with a critical and analytical approach.

1.4 Prerequisites

This course does not emphasize a sophisticated mathematical approach to physics. However, I assume that each person in the class has a robust understanding of algebra and trigonometry. If you do not feel reasonably comfortable in these disciplines, then you should seriously reconsider taking the class after you've had a chance to brush up on your math skills. For example, you will need to be able to solve geometrical problems using trigonometric identities, use the Pythagorean theorem and quadratic formula, solve equations in one and two unknowns, and read and understand graphical data.

2 What to expect in class

2.1 Class routine

Our schedule stipulates that we meet for two hours and fifteen minutes twice a week in the lecture portion of this course. I intend to break the lecture period into two segments of about one hour each, with a short break between. I expect that you will have read the assigned material to be discussed in class each day. A typical class segment will begin with an introductory explanation of a principle or model, which may include a class demonstration. Then, I will present a conceptual problem and ask you to solve it. You will have a minute or two to think about the problem and develop a solution. Then, you will discuss the problem and its solution with your neighbors in class, and together we will come to what we collectively think is the best solution for the problem. I will then summarize the concepts addressed in the problem and perhaps also discuss variations or idiosyncrasies presented by the problem. I will then assess your understanding of the principle and once I feel that the class has a grasp of the topic, we will move on to another principle or model.

2.2 Reading quizzes

The teaching approach I use requires that you read the textbook material before we discuss it in class. To ensure that you read the textbook material, I'm going to give a reading quiz on most days we meet at the beginning of class. You should be able to answer all the quiz questions correctly if you read the material.

2.3 Exam strategy

I will not emphasize memorization of formulae, laws, etc. I believe it is more important for you to focus your effort in understanding the physics conceptually. Consequently, I will allow you to bring a single page of notes to class when I administer exams. The notes page may contain any information that you feel will be helpful to you during the exam. Table 2 below shows the quiz and exam schedule.

3 Grading

In this section, I discuss how your grade will be determined. Although it is possible that the final grading method may vary from this approach, I expect to adhere to this scheme closely.

3.1 Class participation

You will not be graded on either attendance or your participation in class. **However**, if you do not come to class or participate actively in class, do not expect to receive a good grade. Although this course is primarily based on a lecture format, I will endeavor to make the class as interactive as possible. You will be required to attempt to solve problems and defend those solutions in small group discussions with your peers. In my experience, learning to develop an analytical approach for a particular problem and then defending that approach with your peers is one of the strongest skills to which a professional in any discipline can aspire. Take advantage of the environment we create in class and learn from it!

3.2 Quizzes

As discussed above, I will administer reading quizzes at the beginning of class. The cumulative grade on these quizzes will account for 10 percent of your final grade.

3.3 Homework

Completing the homework assignments is critical to your success. Although I will work hard to create a stimulating learning environment in class, my own experience suggests that you'll need some study time on your own to work out the conceptual and mathematical framework you need to be successful in this class. As a result, I will assign a reasonable homework load to assist your learning process.

You will be required to submit homework to be graded. I will not grade either the accuracy or the quality of your solutions to the homework problems; I will only grade whether you did the homework or not. I will post solutions to the homework throughout the semester, usually before the homework is due. It is your responsibility to ensure that you understand each problem and can work through similar problems on your own.

The cumulative grade on homework assignments will account for 10 percent of your final grade.

3.4 Exams

I will administer five exams during the semester, plus a final exam. Each midterm exam will account for eight percent of your final grade, and the final exam will account for 25 percent of your final grade, for a total of 65 percent of your final grade.

3.5 Laboratory grade

You will not receive a separate grade for the laboratory portion of this class. Your laboratory grade will be included in the final grade for the class. The laboratory reports will account for 12 percent of your final grade, and the laboratory final exam will account for three percent of your final grade, for a total of 15 percent.

3.6 Letter grading scheme

Letter grades will be determined on an absolute scale. Totals in the 85-100% range will be graded "A", 75-85% range will be graded "B", 65-75% will be graded "C", 50-65% will be graded "D", and anything lower than 50% will be graded "E". Scores in the high portion of each scale will receive a "+" modifier, and scores in the low portion will receive a "-" modifier. The high and low portions are defined by the limits plus or minus two percentage points. This scheme is "guaranteed"; however, I reserve the right to lower the grade cutoffs if necessary.

3.7 Grading summary

In summary, your grade in this class will comprise the sum of your achievements on the quizzes, homework, exams, and laboratory work according to table 1.

Table 1: Grading scheme

Item	weight
Quizzes	10%
Homework	10%
Midterm exams	40%
Final exam	25%
Laboratory reports	12%
Laboratory exam	3%

4 Final notes

4.1 Students with disabilities

Any Student requiring accommodations or services due to a disability must contact Services for Students with Disabilities (SSD) in Room 181 of the Student Service Center. SSD can also arrange to provide materials (including this syllabus) in alternative formats if necessary.

4.2 Plagiarism

I will not tolerate or condone plagiarism in any form. The WSU Student Code defines plagiarism as “the unacknowledged (uncited) use of any other person or group’s ideas or work” (Section 6-22, part IV, subsection D). Any attempt to claim credit for another’s work, in whole or in part, is a violation of this policy and is regarded by the Composition Program as a serious offense. Penalties for plagiarism are at the discretion of each instructor, and may range from, but are not limited to the following: requiring the student to redo the plagiarized assignment, awarding the student a grade of zero on the assignment or awarding the student a failing grade for the course.

I do, however, strongly encourage that you work together with others on homework and other forms of personal study. You may find it useful to create or join a study or homework group. I encourage this form of learning if it suits you. I request that all members of the group contribute meaningfully to the group effort.

4.3 Office hours

I don’t have an office available in which I can hold office hours. However, I typically arrive in the classroom about 30 minutes prior to class, and usually I’ll have time to help you with any questions, homework, etc. at that time. Also, I will be able to stay after class to help you as needed. You may also e-mail with questions, problems, or other issues at the address given at the beginning of this syllabus.

5 Schedules

5.1 Quiz and exam schedule

Table 2 shows the homework, quiz and exam schedule.

Table 2: Homework, quiz and exam schedule

Date	Homework	Quiz	Exam
7 Jan			
9 Jan			
14 Jan	Ch. 1	Ch. 2	
16 Jan	Ch. 2	Ch. 3	
21 Jan	Martin Luther King holiday		
23 Jan	Ch. 3		
28 Jan			Ch. 1-3
30 Jan		Ch. 4	
4 Feb	Ch. 4	Ch. 5	
6 Feb	Ch. 5	Ch. 6	
11 Feb	Ch. 6		
13 Feb			Ch. 4-6
18 Feb	President's Day holiday		
20 Feb		Ch. 7	
25 Feb	Ch. 7	Ch. 8	
27 Feb	Ch. 8	Ch. 9	
3 Mar	Ch. 9		
5 Mar			Ch. 7-9
10 Mar	Spring break		
12 Mar	Spring break		
17 Mar		Ch. 10	
19 Mar	Ch. 10	Ch. 11	
24 Mar	Ch. 11	Ch. 12	
26 Mar	Ch. 12		
31 Mar			Ch. 10-12
2 Apr		Ch. 13	
7 Apr	Ch. 13	Ch. 14	
9 Apr	Ch. 14	Ch. 15	
14 Apr	Ch. 15	Ch. 16	
16 Apr	Ch. 16		
21 Apr			Ch. 13-16
23 Apr	Review		
28 Apr			Final Ch. 1-16

5.2 Homework schedule

Table 3 shows the homework assignments.

Table 3: Homework assignments

Chapter	Concept questions	Problems
1	2, 4, 12, 13	2, 7, 16, 18, 23, 25, 27, 33, 40
2	1, 5, 6, 9, 10, 13, 16, 23	3, 9, 12, 30, 31, 36, 38, 45, 54, 55
3	3, 6, 7, 10, 15, 16, 20, 22	2, 10, 11, 24, 29, 34, 45, 48
4	3, 6, 9, 16	3, 8, 14, 15, 34, 37, 38, 41, 55
5	5, 7, 11, 12, 19, 25	2, 9, 11, 13, 19, 23, 28, 32, 49
6	2, 3, 7, 19, 21	3, 6, 9, 13, 18, 27, 33, 42
7	1, 2, 8, 10, 16, 17	1, 5, 10, 25, 26, 41, 44, 47, 52
8	1, 2, 5, 7, 10, 13, 16	8, 11, 14, 20, 24, 28, 31, 35, 48
9	1, 4, 8, 9, 12, 14	5, 10, 17, 21, 26, 34
10	6, 9, 13, 24, 26, 27	4, 11, 12, 17, 33, 39, 44, 55
11	1, 3, 8, 14, 19, 25	1, 7, 15, 19, 22, 27, 42, 47
12	4, 5, 8, 13, 17, 20	4, 9, 19, 23, 27, 34, 47, 50
13	1, 4, 9, 13, 23, 24	7, 10, 14, 16, 22, 30, 42, 49
14	6, 10, 12, 13, 23, 28	8, 10, 14, 24, 25, 40, 46, 58
15	1, 8, 9, 10, 14, 17, 27	8, 12, 35, 40, 50, 68, 73, 77, 81
16	2, 5, 11, 13, 16, 23	9, 20, 25, 35, 49, 50, 56, 57, 69