

PHY 100 - Elements of a Physical Universe

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Fall 203

(revised: August 24th, 2013)

Course Summary

In this course, we will explore fundamental phenomena in our universe. By exploring these phenomena, we will build an understanding of physical law and develop predictive models. The contents of this course are quite broad; we will touch upon many topics including: describing motion (velocity, acceleration), explaining motion (forces), the law of gravity, conservation of momentum, conservation of energy, structure of matter, states of matter, thermal energy, waves, electricity, and modeling the atom. The course is designed to encourage active thinking and discussion. Your participation in these activities is greatly appreciated.

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1 Objectives

This course serves primarily as a general education science elective. Thus the goals for this course are both to achieve an understanding of basic physics principles as well as satisfy the expectations of the general education program. The contents of this course are quite broad and we will touch upon many topics including: describing motion (velocity, acceleration), explaining motion (forces), the law of gravity, conservation of momentum, conservation of energy, structure of matter, states of matter, thermal energy, waves, electricity, and modeling the atom. In addition, this course strives to have students meet the following general education goals.

- Ability to communicate effectively
- Ability to employ quantitative concepts and mathematical methods
- Ability to think critically and analytically

2 Course Structure

How do we accomplish the objectives set forth in Section 1? It will require effort on both our parts. You will need to be a dedicated student with good time-management skills. In addition, you will need enough confidence to keep your chin up during rough stretches. I will need to develop pedagogically sound teaching tools that make efficient use of your valuable time and directly address those concepts or material that you find most challenging. This section gets at the heart of both of our roles and addresses how your time will be spent inside and outside the classroom.

2.1 The Calculation ... Student's Time on Task

The life of a student isn't easy. You have many demands on your time beyond this course. I need to be reasonable by not assigning more work than is humanly possible. This calculation is an attempt to do just that. In order to determine how much time a student can commit to my course, I've made the following assumptions.

- The student (that's you!) spends a total of 45 hours a week on his or her college studies.
- The student course load is 15 credits.

Therefore, the total time a student is able to commit per week to this course is $\frac{45 \text{ hours}}{15 \text{ credits}} \times 3 \text{ credits} = 9 \text{ hrs}$. These precious hours are allotted to the following tasks.

Table 1: Student time on task per week.

Task	Time (hrs)
actively participating in lecture	3
preclass reading	3
practice problems	3

2.2 Recommended Weekly Schedule

It's all about time management! Learning physics' concepts and procedures takes time ... lots of time. You must practice applying the concepts and principles multiple times and work diligently at clearing up any misconceptions. If you create a regular weekly schedule for studying physics and take the course one step at a time, you will be shocked with the results. If you wait to the last minute and try to cram for an exam, the results will be disastrous. I'm expecting that you will spend 9 hours a week on this course. To spread out the work evenly over the week, I recommend the following schedule:

Day	Activity	Time
Sunday	Take a break!!!	
Monday	Read for Tuesday's lecture	~1.5 hour
Tuesday	Attend class and work on assigned problems.	~2 hour
Wednesday	Read for Wednesday's lecture	~1.5 hour
Thursday	Attend class and work on assigned problems.	~2 hour
Friday	Finish up assigned problems and submit	~1 hour
Saturday	Take a break!!!	

2.3 Course Components

Here is a list of the different aspects of the course and the thinking behind each one.

Preclass Reading Yes, you must read before coming to class. Since we have so little lecture time, we must focus on the more challenging concepts in the course during lecture. Thus, it critical that you come to lecture knowing the basic elements which we will build on in lecture that day. I have allotted one and a half hours of reading before each lecture. The reading for each day will compose of approximately 9 pages (10 minues a page). You need to think deeply about the content and might need to read certain section multiple times. To help you focus on the import points in the text I will devise reading questions for each reading assignment.

Lecture You should be familiar with this part. I attempt to make it engaging and encourage lots of questions.

Concept Questions This is a pedagogical tool to test whether you understand the main point I'm trying to make during lecture. I might also use it to check if you are clear about a subtle issue. Concept Questions also improve your ability to discuss and explain your critical and analytical thinking with your classmates. They promote active thinking during lecture time (rather than rote note-taking) which is critical to the learning process.

Assigned Problems These are problems assigned from the back of the text. They serve to reinforce the course material as well as serve as practice problems for the exam. You are expected to work on these problems after each lecture. If you find yourself struggling with the problems, please seek out a study group, a tutor, or my help. Of course, recitation is an excellent time to receive additional help.

3 Course and Instructor Information

Course: PHY 100

Text: Physics: A Conceptual World View (Seventh Edition)
L. D. Kirkpatrick and G. E. Francis. 2010.
Belmont, CA: Brooks/Cole.

Website: Course material is housed on D2L.

Lecture Location: Merion 112

Lecture Time: Tuesday & Thursday
Section #5: 12:30 pm to 1:45 pm
Section #6: 9:30 am to 10:45 am

Instructor: Kevin B. Aptowicz (Dr. Aptowicz)

Office Location: 227 Schmucker Science Center South

Office Phone: (610) 436-3010

Email: kaptowicz@wcupa.edu

Office Hours: 11:00 am to 12:00 pm (Tuesday and Thursday)
2:00 pm to 3:00 pm (Tuesday, Wednesday, and Thursday)

4 Grading Procedure

Grades! For some, this is the only section that matters. Enjoy.

4.1 Methods for Calculating Your Grade

Two methods will be used to calculate your grade. The resulting highest grade will be your grade for the course.

Method #1		Method #2	
Regular Exams	54%	Regular Exams	75%
Final Exam	16%	Final Exam	25%
Reading Quizzes	15%		
Assigned Problems	15%		

4.2 Grading Components

Regular Exams: There are a total of four regular exams that will occur though-out the semester. The highest three will be averaged to determine your grade for this component.

Final Exam: The final exam is a cumulative exam that occurs at the end of the course.

Reading Quizzes: Nine times during the semester you will be asked to take a multiple-choice reading quiz. The scoring for reading quizzes are

Number Correct	Score
0	10%
1	50%
2	80%
3	100%

The highest six scores of these twelve reading quizzes will be averaged to determine your grade for this component.

Assigned Problems: Both conceptual questions and exercises from the back of the chapters will be assigned and graded weekly.

4.3 Letter Grade Assignment

I assign letter grades according to the following scale.

Numerical Grade	Letter Grade
93.4 - 100.0	A
90.0 - 93.3	A-
86.7 - 89.9	B+
83.4 - 86.6	B
80.0 - 83.3	B-
76.7 - 79.9	C+
73.4 - 76.6	C
70.0 - 73.3	C-
66.7 - 69.9	D+
63.4 - 66.6	D
60.0 - 63.3	D-
below 60.0	F

I do not norm-reference (or scale) grades.

5 Course Policies

Numerous course policies can be found below. If you need more details or have a question, stop by my office.

5.1 Academic Integrity Statement

It is the responsibility of each student to adhere to the university's standards for academic integrity. Violations of academic integrity include any act that violates the rights of another student in academic work that involves misrepresentation of your own work, or that disrupts the instruction of the course. Other violations include (but are not limited to): cheating on assignments or examinations; plagiarizing, which means copying any part of another's work and/or using ideas of another and presenting them as one's own without giving proper credit to the source; selling, purchasing, or exchanging of term papers; falsifying of information; and using your own work from one class to fulfill the assignment for another class without significant modification. Proof of academic misconduct can result in the automatic failure and removal from this course. For questions regarding Academic Dishonesty, the No-Grade Policy, Sexual Harassment, or the Student Code of Conduct, students are encouraged to refer to their major department's handbook, the Undergraduate Course Catalogue, the Rams Eye View, or the University Web Site. Please understand that improper conduct in any of these areas will not be tolerated and may result in immediate ejection from the class.

5.2 Excused Absence Policy

Students are advised to carefully read and comply with the excused absences policy for university-sanctioned events contained in the WCU Undergraduate Catalog. In particular, please note that the “responsibility for meeting academic requirements rests with the student,” that this policy does not excuse students from completing required academic work, and that professors can require a “fair alternative” to attendance on those days that students must be absent from class in order to participate in a University-Sanctioned Event.

5.3 Exams Policy

There are no make-up exams. If you miss an exam for an excused or unexcused absence, you will receive a zero for that exam. However, one exam grade is dropped, and thus the zero will not affect your course grade.

5.4 Assigned Problems

Assigned problems will be graded every week. If you do not submit your work for the week, you will receive a zero. There is one drop for the assigned problems.

5.5 Attendance and Lateness Policy

If you are late to class and the reading quizzes have been collected, you will not be allowed to take the quiz and receive a 0 for that quiz grade. Note, a fraction of the quiz grades are dropped when calculating your final grade. More information can be found in subsection 4.2.

5.6 Teaching Style

This course will rely heavily on lectures using the chalk boards as well as concept questions projected onto a screen. If you have problems seeing the chalk board or reading my handwriting, please move to the front of the class.

5.7 LGBTQA Ally

Based on West Chester University’s commitment to diversity, I believe that everyone in my classroom should feel safe. I have completed the University’s Lesbian, Gay, Bisexual, Transgender, Queer, Questioning Ally training. In becoming an ally I made the commitment to offer a safe space for all of my students, not just those who identify as LGBTQA. If you or someone you know would like to know more about this program, or needs to speak confidentially about issues of sexual orientation or gender identity, please feel free to see me during my office hours.

5.8 Americans with Disabilities Act

If you have a disability that requires accommodations under the Americans with Disabilities Act (ADA), please meet with me as soon as possible so that I can support your success in an informed manner. If you would like to know more about West Chester University’s services for students with disabilities, please contact the Office of Services for Students with Disabilities which is located at 223 Lawrence Center and can be reached at 610-436-3217 and at ossd@wcupa.edu.

5.9 Public Safety

All students are encouraged to sign up for the University’s free WCU ALERT service, which delivers official WCU emergency text messages directly to your cell phone. For more information and to sign up, visit www.wcupa.edu/wcualert. To report an emergency, call the Department of Public Safety at 610-436-3311.

5.10 Intellectual Property

Intellectual Property Statement: The instructor for this course utilizes copyrighted materials under the "Freedom and Innovation Revitalizing United States Entrepreneurship Act of 2007" (Fair Use Act). Apart from such copyrighted materials, all other intellectual property associated with this course is owned and copyright protected by the instructor, including, but not limited to, lectures, course discussions, course notes and supplementary materials posted or provided to students authored by the instructor, assessment instruments such as quizzes and exams, and Power Point presentations. No recording, copying, storage in a retrieval system, or dissemination in any form, whether electronic or other format, by any means of the intellectual property of the instructor, either in whole or in part, is permitted

without the prior written permission of the instructor. When such permission is granted, it must specify the utilization of the intellectual property and all such permissions and waivers shall terminate on the last day of finals in the semester in which this course is held.

Links and references to on-line resources provided by the instructor may lead to other sites. The instructor does not sponsor, endorse or otherwise approve of any information appearing in those sites, nor is responsible for the availability of, or the content located on or through, external sites. Apart from materials used in accordance with the Fair Use Act, the instructor takes no responsibility for material that is otherwise offered at web sites and makes no warranty that such material does not infringe any third party rights. However, should any of this type of material be present and this fact is brought to the attention of the instructor, they will remove references to it from course materials.

6 Schedule

To accomplish all of the objectives set forth in Section 1 will require us to stick to a firm schedule. I've listed the schedule below

Class	Date	Day	Lecture	Chapter
1	Aug 27	Tu	1	Introduction & Chapter 1
2	Aug 29	Th	2	Chapter 2
3	Sep 3	Tu	3	Chapter 3
	Sep 5	Th	4	Chapter 3
4	Sep 10	Tu	5	Chapter 4
5	Sep 12	Th	6	Chapter 4
6	Sep 17	Tu	7	Chapter 5 & Review
7	Sep 19	Th	8	Exam #1 - Chapters 1, 2, 3, and 4
8	Sep 24	Tu	9	Chapter 5
9	Sep 26	Th	10	Chapter 6
10	Oct 1	Tu	11	Chapter 7
11	Oct 3	Th	12	Chapter 11 & Review
12	Oct 8	Tu		NO CLASS
13	Oct 10	Th	13	Exam #2 - Chapters 5, 6, and 7
14	Oct 15	Tu	14	Chapter 11
15	Oct 17	Th	15	Chapter 11
16	Oct 22	Tu	16	Chapter 12
17	Oct 24	Th	17	Chapter 13
	Oct 29	Tu	18	Chapter 13
18	Oct 31	Th	19	Chapter 15
19	Nov 5	Tu	20	Chapter 15 and Review
20	Nov 7	Th	21	Exam #3 - Chapters 11, 13, and 13
21	Nov 12	Tu	22	Chapter 20
22	Nov 14	Th	23	Chapter 23
23	Nov 19	Tu	24	Chapter 23
24	Nov 21	Th		NO CLASS
25	Nov 26	Tu	25	Chapter 24
26	Nov 28	Th	26	Chapter 24 and Review
27	Dec 3	Tu	27	Exam #4 - Chapters 15, 20, and 23
28	Dec 5	Th	28	Review
Section 6 (9:30 am class)	Dec 10	Tu		Final Exam (8 am)
Section 5 (12:30 pm class)	Dec 10	Tu		Final Exam (10:30 am)