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Office Hours: MWF: 1:00pm – 3:00pm;Th 9:00am – 10:00am
By Appointment
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Course: Physics 110 Fall 2009
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Text: Physics of the Life Sciences, by J. Newman

Suggested Texts/References:

Physics, 5th Ed., by D. Giancolli
Physics, 7th Ed., by J. Cutnell & K. Johnson
College Physics, by R. Serway & J. Faughn
Life Science Applications for Physics, by J. Faughn
Physics of the Body, 2nd Ed., by J Cameron, J. Skofronick, & R. Grant
Biomedical Applications of Intro. Physics, by J. Tuszynski & J. Dixon
Physics in Biology and Medicine, by P. Davidovits
Human Physiology, 5th Ed., By L. Sherwood
Clinically Oriented Anatomy, 5th Ed., by K. Moore & A. Dalley

Course:

This course serves as an introduction to those basic concepts of physics that form the foundation of all the natural sciences. The first of a two-course sequence in Physics for the Life Sciences, this course serves to introduce the student to the fundamental laws of classical mechanics and are applied to a variety of simple systems including many from the biological sciences. Throughout the course the conservation laws serve as unifying physical principles. Mathematics, a powerful tool in the understanding of natural phenomena, assumes its natural role.

Attendance:

While attendance is not mandatory, it is expected that you will attend class on a regular basis. Material will be covered in a rapid fashion over the spring term; covering about one chapter per week. Past experience dictates that your success in this class is directly proportional to your attending. Attendance at all scheduled exams and labs is mandatory.

Course Grade:

Your course grade will be determined based on a professional judgment of your work on the following scale:

Quizzes	10%
Homework	10%
Three in Class Exams	30%
Final Exam	30%
Lab	20%

The overall class average at the end of the term will generally be set to a ***B***$^{-}$ letter grade. ***No letter grades will be assigned to any individual work.*** An attempt will be made after every exam to give you a ***rough idea*** of an ***overall*** grade based on all work completed to date if a grade were to be assigned at that time, based on the class' average of a B^{-}.

Homework:

- The homework assigned is representative of the topics that will be highlighted throughout the term. It is strongly advised that you do the suggested homework as noted in class as well as other relevant problems, of your choosing, on the covered topics from the text. ***Variations*** of the assigned and unassigned homework are highly probable candidates for the quizzes and the exams.
- In general, homework problems will be assigned each night (from Wednesday to Monday) and a small subset of problems will be collected during class each Wednesday. The solutions to the problems will be posted on my website after class on Wednesday. In addition, I will post on my website and will announce in class Monday the subset of the assigned problems that I will collect on Wednesday.
- There will not be homework collected on the first Wednesday of the term.
- Once the homework solutions have been posted, late homework will be accepted and will be assigned a value of 50% of the points for the assignment.

I would advise you talk to me, your classmates, the Physics Crisis Center (T/Th 7^{pm} – 10^{pm}), or just ponder the question for a day or so. ***Too often students' confuse reading the solution to the problem with their actual understanding of the problem***. The mathematical complexity of this course is limited to your ability to do algebra as well as basic mathematical operations.

Quizzes:

- There will be seven (7) quizzes, given at the end of class on Fridays, every week in which there is no exam scheduled. These quizzes will have a maximum length of fifteen (15) minutes.
- ***No make-up quizzes will be allowed for any reason***.

Exams:

- There will be three (3) in class exams, approximately one (1) hour each, and a cumulative two (2) hour final exam. Each hour exam will not be cumulative; however they will be based on your prior knowledge.
- ***Emphasis will be placed on demonstration of the ability to apply the concepts and techniques learned to new situations.***
- If you cannot make a scheduled exam, then it is your responsibility to contact the instructor ***in person a minimum of at least 24 hours in advance of the exam*** and make other arrangements for a make-up exam. ***Make-up exams will be granted only in exceptional circumstances, as determined solely by the instructor, and Nov. be oral and will be given at the discretion and convenience of the instructor.***
- The final exam will be cumulative and no make-up exam will be given for any reason. The date and time of the final is set by the Registrar and will be announced in class. ***This is the only time that the final exam will be given***. Please do not make other plans before you know when the final exam is scheduled.

Labs:

All labs must be attended. Everyone in Physics 110 must complete the laboratory sequence. ***You cannot pass the course without having passed the lab.*** The format for the lab write-ups will be discussed in the laboratory class.

Notes:

1. This course is heavily dependant on geometry, as well as some algebra and trigonometry. It is expected that the student is familiar with these mathematical topics. Calculus will be used very infrequently, and only to speed up a derivation. It will not be required for you to know or be able to actually do any calculus. You will need to bring your textbook and a calculator (one that does basic mathematics, like trigonometry and logarithms, is fine) to class everyday. ***You will not be allowed to share calculators during quizzes or exams.***

2. Please realize that the instructor is human, just as you the student. I will make mistakes. To that end, on exams, quizzes, etc., if I have made a mistake, please bring it to my attention and I will correct it. However, if you are just seeking to get more points back without any substantive argument as to why you disserve the points, I will be happy to re-grade the entire quiz/exam. This Nov. result in raising or lowering the present grade on the quiz/exam.

3. All grading must be contested within twenty-four (24) hours after the original assignment was returned. ***Contestations must be accompanied by a full written explanation of how your solution was incorrectly penalized.*** I will not look at anyone's appeal without a written explanation. I will return the appeal and the decision of points after 24 hours.

4. This course is going to be very demanding on you. It will be one of the most challenging courses you will take at Union College. You cannot sit idly by and assume that you know or will learn the material the night before the quiz/exam. It will require a lot of work on your part, as well as mine. If we work together, I hope, by the end of the term the beauty and applicability of physics will be evident in your everyday lives.

5. This class may be numbered as a 100 level class. It is by no means a trivial introduction to the study of physics. Physics underlies every other subject and as such its importance cannot be trivialized. This is a very demanding class and cannot be emphasized enough. The difficulty level of this class is on par with Bio-225 (Cell & Molecular Biology) and Chm-231 & 232 (Organic Chemistry I & II).

6. I realize that in this technological age people without computers, high-definition TV, beepers and cell phones are in the minority. For those of you that have any of these sorts of devices and need to bring them to class with you, please turn them off (or at lease put them on vibrate.)

7. For exams and quizzes, cell phones will not be allowed anywhere on your person. Please shut them off and hide them away in your bags. Quizzes and exams Nov. be removed from you for using a cell phone.

Tentative Course Outline

Week # 1

Wed. Sept. 9	Introduction/Policies/Course Outline/Read Chapter 1
Thurs. Sept. 10	Ch. 2 1-D Motion Section 2.1
Fri. Sept. 11	Ch. 3 1-D Motion Section 3.1
Mon. Sept. 14	Problems involving 1 & 2-D Motion

Week # 2

Wed. Sept. 16	Ch. 5 Vectors and Motion in more than 1-D Sections 5.1 – 5.2
Thurs. Sept. 17	Ch. 2 Forces Sections 2.2 - 2.6
Fri. Sept. 18	Problems involving 1 & 2-D Motion
Mon. Sept. 21	Ch. 3 1-D Motion and Force, Applications of Newton's Laws Section 3.3

Week # 3

Wed. Sept. 23	Ch. 5 Motion and Forces in 2-D Sections 5.3 - 5.5
Thurs. Sept. 24	Problems involving Forces
Fri. Sept. 25	Ch. 5 Motion, Forces and Energy in 2D Sections 5.5 - 5.6
Mon. Sept. 28	Problems involving Forces

Week # 4

Wed. Sept. 30	**Exam #1 Chapters 1 - 3, 5**
Thurs. Oct. 1	Ch. 4 Work and Energy Sections 4.1 - 4.3
Fri. Oct. 2	Ch. 4 Work and Energy Sections 4.3 - 4.4
Mon. Oct. 5	Ch. 4 Work and Energy Sections 4.4 - 4.5

Week # 5

Wed.	Oct. 7	Chapter 4 Problems
Thurs.	Oct. 8	Chapter 4 Problems
Fri.	Oct. 9	Ch. 6 Momentum Sections 6.1 – 6.2
Mon.	Oct. 12	Ch. 6 Momentum Sections 6.1 – 6.2

Week # 6

Wed.	Oct. 14	Chapter 6 Problems
Thurs.	Oct. 15	No Class – I'm away
Fri.	Oct. 16	**Exam #2 Ch. 4 & 6**
Mon.	Oct. 19	Ch. 7 Rotational Motion Sections 7.1 - 7.3

Week # 7

Wed.	Oct. 21	Ch. 7 Rotational Motion Sections 7.4, 7.7
Thurs.	Oct. 22	Chapter 7 Problems
Fri.	Oct. 23	Chapter 7 Problems
Mon.	Oct. 26	Ch. 8 Fluids Sections 8.1 - 8.2

Week # 8

Wed.	Oct. 28	Ch. 8 Fluids Sections 8.3 - 8.4
Thurs.	Oct. 29	Ch. 8 Fluids Sections 8.5 - 8.6
Fri.	Oct. 30	Chapter 8 Problems
Mon.	Nov. 2	Chapter 8 Problems

Week # 9

Wed.	Nov. 4	Ch. 10 Waves and Resonance Sections 10.1 - 10.2
Thurs.	Nov. 5	Ch. 10 Waves and Resonance Sections 10.3 - 10.5
Fri.	Nov. 6	Chapters 10 Problems
Mon.	Nov. 9	**Exam #3 Ch. 8 & 10**

Week # 10

Wed.	Nov. 11	Ch. 11 Sound Sections 11.1 - 11.3
Thurs.	Nov. 12	Ch. 11 Sound Sections 11.4, 11.6 - 11.7
Fri.	Nov. 13	Chapters 11 Problems
Mon.	Nov. 16	Review of Final Exam/Evaluations