Physics 110
Spring 2014

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MWF 8 – 9:05 + Tu 8:00 – 8:50
Plus laboratory section
Office Hours: Mornings after class, or by arrangement or just drop in

Textbook: **Physics of the Life Sciences** by JN
Course WebSite: http://minerva.union.edu/newmanj/Physics110 - note the capital P !!

Course Content

This course is designed to provide an introduction to physics and its applications in the life sciences. Hopefully you will not only learn a good deal of physics but also see its utility in a myriad of biological and medical applications. But also, probably just as important, you will hopefully learn how to think logically through difficult word problems and strategize attempts at solutions. Throughout the course examples from life sciences will illustrate the physics. This term we'll study mechanics, which is the science of mass and motion, fluids, waves, sound and lastly thermodynamics, if time permits.

Text

We're going to use my textbook in this course. I've taught this course often and was never satisfied with the books available and a number of years ago had the opportunity to write this book with the Union course in mind. There are many more applications of the physics in life sciences and hopefully you will find the reading and material more interesting than if we had used another book.

My job in this course is to convey the basic physical concepts needed to understand biological topics, to illustrate a good number of them in class and to set you on the path towards doing well in this class. *Your job* is to stay on top of the material by reading the text, doing the homework, and participating in class. **Most of the real learning in this course will go on in your efforts outside of class.** Just as you would practice a sport to get good at it, ***you must practice physics***; the HW is your chance to do this.

Work Load and Study Hints

There is a lot of difficult material that will require a consistent effort on your part to do well in this class. I will assign readings and homework on a regular basis, but will not collect it. The exercises are for your benefit – in fact **it is impossible to learn the material without actively tackling the problems and questions for each chapter**. Answers to the odd numbered problems and multiple choice questions are in an Appendix in the text. Worked out solutions to all assigned problems will be posted on the web. For the best learning experience in problem solving you need to spend sufficient time trying to solve the problems before consulting the

solutions – simply reading them over will not allow you to solve another, slightly different problem. Similarly, a quick read through the example problems in the text will not provide you with the ability to solve a similar problem or answer a related question on your own. There is a study room for students – N305 and you are welcome to use this room anytime – day or night – to study in. I recommend using it often since it is near my office and you can drop in with questions. There will also be free tutoring in the Physics Help Center (I'll announce the schedule). I strongly suggest that you make a serious attempt at the questions/problems first on your own, then with a study partner/or/group, and then by consulting my written solutions. Don't jump to reading my solutions without serious attempts on your own since it really is a poor way to learn the material. Also remember that the assigned problems really represent a minimum core that you should look at- if you have trouble with many of these then you should make sure to try additional questions/problems to test your understanding. This is the best way to study- do not simply re-read your (or my) previous solutions to assigned problems. *Finally I am a resource that you should use* and you are strongly encouraged to come and discuss your questions with me during office hours, after class or at any other arranged time.

Course Requirements and Grading

The lab is a required portion of the course and ***you must complete all 7 laboratories to pass the course.*** If you cannot make a particular lab, it is your responsibility to contact your lab instructor (before the lab if at all possible) to schedule a make-up time. All laboratory handouts are posted on the web site and you should print out a copy of the handouts for each week before going to lab.

To help prod you into keeping up with the work, in weeks when we do not have an hour exam there will be ***short – 10 minute – quizzes based on the homework, usually on Tuesdays***. These should be straightforward if you have spent some time on the homework and should help boost your grade. ***No make-up quizzes will be given and the lowest quiz grade will be dropped***. Your grade in this course will be based on my judgment of your performance roughly based on the following scheme:

	Method 1	Method 2
Tests	45% (3 at 15% each)	30 % (3 at 10% each)
Final	25%	35%
Quizzes, Classwork	10%	15%
Lab	20%	20%

Method 1 gives a greater weight to the mid-term exams, and a lower weight to the final exam and quizzes. Method 2 gives greater weight to the final and quizzes, and a lower weight to the mid-term exams. Your final grade will be calculated by *both* methods, and you will receive the higher of the two grades.

The three in-class exams will be in:

Exam 1	**Monday April 21, week 4**
Exam 2	**Monday May 12, week 7**
Exam 3	**Wednesday May 28, week 9**

Make-up exams are only given in exceptional circumstances.

Learning Disabilities

I encourage students with disabilities, including non-visible disabilities, to discuss with me (in private) appropriate accommodations that help facilitate your learning. You will need appropriate documentation from the Dean of Students Office. All discussions will remain confidential.

Honor Code

All students are expected to abide by the Union College Academic Honor Code.