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, fluids, and thermodynamics, 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 fall 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.
• Several homework problems will be assigned each night (from Friday to Wednesday) and the entire set of problems will be collected during class on Thursday. The solutions to the problems will be posted on my website immediately after class on Thursday. I will grade a random subset of the assigned problems.
• There will be no homework collected on the first Thursday of the term. Assignments for the first week will be collected during the second week.
• Under no circumstances will late homework be accepted. I would advise you talk to me, your classmates, 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 every week in which there is no exam scheduled. They are usually given at the end of class on Fridays. These quizzes will have a maximum length of fifteen (15) minutes.
• No make up quizzes will be allowed for any reason.
• Time remaining will be announced by clock and generally after 15 minutes, I will leave the room. Quizzes need to be handed in before I leave the room or the quiz will not be accepted.

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, which includes all topics covered up to the exam in Physics 110.
• 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 may 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. Time remaining will be announced by clock in the front of the room and I will leave the room at the completion of the exam period. Exams need to be handed in before I leave the room or the exam will not be accepted.
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 deserve the points, I will be happy to re-grade the entire quiz/exam. This may 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 and Chm-231 & 232.

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 least 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 may be removed from you for using a cell phone.
Tentative Course Outline

Week # 1
Wed. Sept. 10  Introduction/Policies/Course Outline/Read Chapter 1

Thurs. Sept. 11  Ch. 2  1-D Motion
                Section 2.1

Fri. Sept. 12  Ch. 3  1-D Motion
                Section 3.1
                Ch. 5  Vectors and Motion in more than 1-D
                Sections 5.1 – 5.2

Mon. Sept. 15  Ch. 5  Vectors and Motion in more than 1-D
                Sections 5.1 – 5.2

Week # 2
Wed. Sept. 17  Ch. 2  Forces
                Sections 2.2 - 2.6

Thurs. Sept. 18  Problems involving 1 & 2-D Motion

Fri. Sept. 19  Ch. 3  1-D Motion and Force, Applications of Newton’s Laws
                Section 3.3

Mon. Sept. 22  Ch. 5  Motion and Forces in 2-D
                Sections 5.3 - 5.5

Week # 3
Wed. Sept. 24  Ch. 5  Motion, Forces and Energy in 2D
                Sections 5.5 - 5.6

Thurs. Sept. 25  Problems involving Forces

Fri. Sept. 26  Problems involving Forces

Mon. Sept. 29  Exam #1 Chapters 1 - 3, 5

Week # 4
Wed. Oct. 1  Ch. 4  Work and Energy
                Sections 4.1 - 4.3

Thurs. Oct. 2  Ch. 4  Work and Energy
                Sections 4.3 - 4.4

Fri. Oct. 3  Ch. 4  Work and Energy
Sections 4.4 - 4.5

Mon. Oct. 6 Chapter 4 Problems

**Week # 5**

Wed. Oct. 8 Ch. 6 Momentum
Section 6.1

Thurs. Oct. 9 Ch. 6 Momentum
Section 6.2

Fri. Oct. 10 Ch. 6 Momentum
Sections 6.

Mon. Oct. 13 Chapter 6 Problems

**Week # 6**

Wed. Oct. 15 Ch. 7 Rotational Motion
Sections 7.1 - 7.2

Thurs. Oct. 16 Ch. 7 Rotational Motion
Section 7.3

Fri. Oct. 17 Ch. 7 Rotational Motion
Sections 7.4, 7.7

Mon. Oct. 20 Chapter 7 Problems

**Week # 7**

Wed. Oct. 22 **Exam #2 Ch. 4, & 6 – 7**

Thurs. Oct. 23 Ch. 8 Fluids
Sections 8.1 - 8.2

Fri. Oct. 24 Ch. 8 Fluids
Sections 8.3 - 8.4

Mon. Oct. 27 Ch. 8 Fluids
Sections 8.5 - 8.6

**Week # 8**

Wed. Oct. 29 Chapter 8 Problems

Thurs. Oct. 30 Ch. 10 Waves and Resonance
Sections 10.1 - 10.2
<table>
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<th>Day</th>
<th>Date</th>
<th>Topic</th>
<th>Sections</th>
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<tr>
<td>Fri.</td>
<td>Oct. 31</td>
<td>Ch. 10 Waves and Resonance</td>
<td>10.3 - 10.5</td>
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<td>Mon.</td>
<td>Nov. 3</td>
<td>Ch. 11 Sound</td>
<td>11.1 - 11.3</td>
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<td><strong>Week # 9</strong></td>
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<td>Wed.</td>
<td>Nov. 5</td>
<td>Ch. 11 Sound</td>
<td>11.4, 11.6 - 11.7</td>
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<td>Thurs.</td>
<td>Nov. 6</td>
<td>Chapters 10 and 11 Problems</td>
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<td>Fri.</td>
<td>Nov. 7</td>
<td><strong>Exam #3 Ch. 8, &amp; 10 - 11</strong></td>
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<td>Mon.</td>
<td>Nov. 10</td>
<td>Ch. 12 Thermal Energy</td>
<td>12.1 - 12.2</td>
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<td><strong>Week # 10</strong></td>
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<tr>
<td>Wed.</td>
<td>Nov. 12</td>
<td>Ch. 12 Thermal Energy</td>
<td>12.3 - 12.4</td>
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<tr>
<td>Thurs.</td>
<td>Nov. 13</td>
<td>Ch. 12 Thermal Energy</td>
<td>12.4 - 12.7</td>
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<td>Fri.</td>
<td>Nov. 14</td>
<td>Chapters 13 Problems</td>
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<td>Mon.</td>
<td>Nov. 17</td>
<td>Review of Final Exam/Evaluations</td>
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