Instructor: Steven Wiles  
Campus Phone: 657-1648  
Office: Sci 131  
Email: swiles@msubillings.edu  
Office Hours: MF 10:30-11:30, T 3:30-4:30, W 2-3, R 1-2  
Also, whenever my door is open or by appointment.

Course Description:

This course is the laboratory complement to the lecture material covered in Phys 210. This course will give you experience with the real-world application of physical principles you are covering in class. This experience will help reinforce your understanding of the lecture material, as well as give you an appreciation for all the real-world complexities that are not recognized in the theoretical presentation of physics.

Grading:

Your grade in this course will be based on nine labs, listed under Schedule. After performing each lab, you are expected to complete and submit a write-up for grading. The labs will be weighted equally with respect to your final grade. These lab write-ups will be worth 20 points each. There are no lab exams in this course. Your final grade in the course will be the average of the nine lab grades. Letter grades will be based on the standard 10 point scale (>90% = A, 89%-80% = B, etc.).

Each lab write-up will be due by 5:00pm on Thursday. Your grade will be docked by 10% for each school day that your write-up is not turned in. A late write-up should either be turned into me personally (during office hours, for example), turned into my mailbox in the Science Office, or placed in the appropriate box on the glass case across from my office. Late labs should not be slipped under my office door, as they are likely to get stepped on, mutilated, or lost.

Each of you will be working with at least one lab partner during your regular lab meetings. You will collect the same data from your labs, and it is expected that you will collaborate on analyzing the data and will have the same numerical results. However, anytime you write an English sentence, it should be in your own words (answering questions, for example). Lab partners should not be turning in identical lab write-ups. If partners turn in absolutely identical lab write-ups, only one will be graded and each partner will receive half the points.

You will be expected to have read the lab manual before you perform each lab, and come into lab prepared. The manuals for this course may be downloaded from my webpage at http://www.msubillings.edu/ScienceFaculty/Swiles/ (under the appropriate course’s link) or at the department webpage http://www.msubillings.edu/Sciences/, under “Faculty Web Pages, Syllabi, Course Materials”
Lab Write-ups:

Each write-up needs to have a cover sheet with the following information

Name and Number of Lab:
Prepared By:
Lab Partner:
Date:
Section Number:

Your lab write-ups will consist of answering all the questions and performing all the calculations requested of you in the lab manuals. You may complete these write-ups on separate pieces of paper, or you may use the lab manuals themselves. The lab manuals often have sections set aside within them for just such a purpose. In either case, the write-ups must follow certain basic ground rules:

- The write-ups should be neat and legible.
- Answers to questions should be complete sentences and complete thoughts, and should refer back to the appropriate question in the lab manual in an unambiguous fashion (writing the question again before the answer is the best way to do this.).
- Any calculations you do must include the following: the original data used in the calculations, the formula being used (in algebraic form), the formula with the appropriate numbers plugged in, the final answer.

**Example:**

\[
m = 125 \text{ g}, \quad a = 9.806 \text{ m/s}^2
\]

\[
F = m a
\]

\[
F = (0.125 \text{ kg})(9.806 \text{ m/s}^2)
\]

\[
= 1.23 \text{ N}
\]

- All quantities must be written with correct units. This includes original data, quantities used mid-calculation, and final answers.
- All calculations must involve correct use of significant figures.
- You will occasionally be required to do graphs. These graphs should follow these rules:
  - They should be drawn neatly on graph paper (available at the bookstore or any office store), *not* sketched by hand.
  - Each graph should be given a title identifying it, and its axes should be labeled by name and with appropriate units.
  - Each graph should occupy a single sheet of paper. You may use the front and back of double-sided graph paper, each side for one graph.
  - The scale of axes should be chosen so that your data points use nearly the whole graph.
  - When determining slope, show points used and calculations of the slope on the graph.
Schedule:

The schedule of labs we will be performing is shown below. If for some reason you have to miss a scheduled meeting, you will have to make it up as soon as possible. My contact information is given at the beginning of this syllabus. If you know you will be missing a lab beforehand, I expect to be informed of your upcoming absence.

I will only allow a student to perform a make-up lab for a valid reason. I am the final arbiter for what constitutes a valid reason. I will also require a signed note (from a coach, police officer, next of kin, etc.) explaining the reason for the absence. If you do not make up a lab or do not provide a valid excuse, you will receive a zero for that lab.

<table>
<thead>
<tr>
<th>Date</th>
<th>Lab</th>
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<tbody>
<tr>
<td>Sept 12</td>
<td>Constant Acceleration</td>
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<tr>
<td>Sept 19</td>
<td>Projectile Motion</td>
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<tr>
<td>Sept 26</td>
<td>Inclined Plane</td>
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<tr>
<td>Oct 3</td>
<td>Uniform Circular Motion</td>
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<td>Oct 10</td>
<td>No lab</td>
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<tr>
<td>Oct 17</td>
<td>No lab</td>
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<tr>
<td>Oct 24</td>
<td>Conservation of Momentum and Energy</td>
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<td>Oct 31</td>
<td>The Simple Pendulum</td>
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<td>Nov 7</td>
<td>No lab</td>
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<tr>
<td>Nov 14</td>
<td>Archimedes’ Principle</td>
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<td>Nov 21</td>
<td>Week of Thanksgiving, no lab</td>
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<tr>
<td>Nov 28</td>
<td>Simple Harmonic Motion</td>
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<tr>
<td>Dec 5</td>
<td>Resonance</td>
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