Physics 407 Senior Laboratory in Modern Physics  
Fall 2011, Room 236 Science & Technology I  
Monday and Wednesday 13:30 - 17:00

Instructor: Phil Rubin  
Office: 359 Science & Technology I  
Phone: 703.993.3815 (least effective)  
E-mail: prubin@gmu.edu (most effective)  
Office Hours: Monday and Wednesday 8:30-10:00  
Text: Melissinos & Napolitano, Experiments in Modern Physics  
Website: http://physics.gmu.edu/~rubinp/courses/407/  
Pre-requisites: 21 credits of physics courses, including PHYS 305 and 308

Please note:

- All e-mail communication from the instructor concerning this course will be to GMU accounts only.
- If you are a student with a disability and you need academic accommodations, please see me and contact the Office of Disability Resources at 703.993.2474. All academic accommodations must be arranged through that office.

Course Goals:

1. To gain experience in scientific practice
   - model construction
   - design
   - instrumentation
   - data collection
   - analysis
   - interpretation
   - presentation

2. To fulfill the writing-intensive requirement for the Physics major

Expectations

- Safety (10%)  
  - Lectures and readings on lab and radiation safety  
  - Quizzes
- Exercises (20%)  
  - Homework
Electronics, instrumentation, and data acquisition units

Experiments (70%)
1. Simple experiments (15%)
2. Conceptual experiment (15%)
3. A complete investigation, from theory to paper (40%)

Grading:

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<tr>
<th>Grade</th>
<th>Range</th>
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<tbody>
<tr>
<td>A+</td>
<td>100-96.67</td>
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<tr>
<td>A</td>
<td>96.66-93.33</td>
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<tr>
<td>A-</td>
<td>93.32-90</td>
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<tr>
<td>B+</td>
<td>89.99-86.67</td>
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<tr>
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<td>D</td>
<td>69.99-60</td>
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<td>F</td>
<td>&lt;60</td>
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Tentative Schedule At least for the first half of the term, and also whenever presentations will be made, we’ll meet for half the scheduled class time in lecture or seminar format (room 310 or 306, SkT I), while the second half of the meeting time will be spent in the laboratory (rooms 236 and 240). The laboratory is accessible at other times with a key signed out from the main office. A signed-out key must be returned to the office (slid under the door if outside of hours (8:30-18:00) immediately upon leaving the laboratory. Failing to do so will be considered cheating. Failing to sign out when procuring a key is considered stealing. Either of these behaviors is dishonest and will be treated as an honor code violation (see below).
week  topics
1  introduction; safety
2  safety quizzes; choose experiment
3  simple experiments; labview
4  simple experiments; labview; physics overview
5  simple experiments; labview
6  simple experiments; labview, experimental design
7  conceptual experiment; experiment
8  conceptual experiment; raw data
9  conceptual experiment; experiment
10 conceptual experiment; experiment; results
11 experiment
12 full presentation
13 full presentation
14 paper

Attendance and Tardiness:  Something will be due almost every meeting of the class. Unless excused on the basis of justifying documentation, no assignment that must be turned in will be accepted from an absent or tardy student, and a grade of zero (0) will be assigned.

Notebooks: Complete records of all experimental activities must be kept as evidence for the veracity of reported results. These records should be permanent and referable in case questions arise either later in an investigation or subsequent to publication in any form. Typically, a notebook, of the sort without loose paper, such as a bound composition notebook is preferred. A spiral notebook is acceptable, but a three-ring binder is not. Pages in the notebook should be numbered consecutively, either by the manufacturer or by hand, and never removed from the notebook. Entries should never be erased or blacked/whited out. A single line through a mistake is all that is necessary. The notebook is often left at the site of a running experiment, so that there is no chance that it can be lost or damaged during transport. You must be able to produce such a record for the work you present in this course or else face a grade of zero (0) for the work reported.

Disruptive Behavior: Misbehavior of any sort, including cell-phone use, unauthorized computer use, and eating or drinking in the laboratory or classroom, will not be tolerated. Such actions are grounds for dismissal from the classroom and the grading of a zero (0) on the assignment due that day. Cell phones must be turned off before entering the classroom and laboratory and remain off and out of sight.

Honor Code Violations: Science is impossible when dishonesty, in any manifestation, exists. It’s the worst possible conduct a scientist can display. Dishonesty of any sort (cheating, plagiarism, lying, stealing), as determined by
the instructor, will result in an automatic F in the course, without recourse to appeal. Those so accused will be reported to the honor council for further disciplinary action. Regardless of the results of council actions, the failing grade stands. **Don’t cheat. Don’t even look like you’re cheating.**

The GMU Honor Code: [http://www.gmu.edu/catalog/9798/honorcode.html#code](http://www.gmu.edu/catalog/9798/honorcode.html#code)