

# Physics Capstone Westminster College

## 1 Contact Information

Instructor: Doug Armstead  
Office: 124 Hoyt (724) 946-7201  
Official Office Hours: MWF 1:30-2:30pm.  
Email: armstedn@westminster.edu

## 2 The Point of this Class

In Physics 601 your goal is to develop a project capstone, begin work on it and complete enough to present your plan, motivation, and preliminary results to the physics department. In Physics 602 you will finish your experimentation, write a thesis style document, and present your results both in poster form and in an oral presentation.

There are a number of mile stones that you must reach during the year to demonstrate appropriate progress toward completing your project. They are identified below.

Capstone class is also a forum to bring in questions pertaining to your preparation for your time after leaving Westminster College. This might include questions related to applying to graduate school, preparing for the physics GRE, strategies for searching for employment.

## 3 Grades

Your grade for the fall portion of the course is based on the following things:

- Timely identification of a capstone project.
- Progress being make on carefully maintaining your laboratory notebook. Your notebook should be complete enough that you could recreate in April what you did in October.
- Clear and professional talk reviewing a journal article that is relevant to the project you have choosen.

- Showing steady progress in building apparatus, writing computer code, and/or performing initial calculations as is appropriate to the project.
- Clear and professional talk to physics faculty and majors that provides the motivation for your research, identifies the goal of your project, and gives some degree of preliminary results from your project.

Your grade for the spring portion of the course is based on the:

- Continued good progress on your project.
- Poster presentation at the spring undergraduate research symposium or the March APS meeting in Pittsburgh.
- Well written thesis style document (see Capstone Paper below) that presents your capstone project.
- A completed, well maintained laboratory notebook.
- Your Capstone presentation (see below).

### 3.1 Capstone Paper

Your capstone paper is a document with the following distinct parts

Title Page: Should include your title, name, advisor, and date.

Abstract: A single paragraph description of your project and major results.

Introduction: Your introduction will provide the motivation for your project, the context in the academic literature for your project, and a brief overview of your project.

Theory: A primer on the theory that underpins your project.

Procedure: Detailed description of what you did and how you did it.

Results: Should be presented as figures, tables, etc.. All figures must have a caption.

Discussion: A comparison with the theoretical predictions, and some of the implications of your work.

Conclusions: A discussion of the bigger implications of your project and recommendations for further work to be done.

References: Plagiarism is not acceptable.

### 3.2 Capstone Presentation

Your Capstone presentation is a clear and professional talk to physics faculty and majors that expresses the motivation for your project, what that project is, the key results from the project and the implications of those results. It will require either the use of transparencies or presentation software (e.g. Keynote or Powerpoint). You should be prepared to answer detailed questions about your project during this presentation. It is important that you practice this talk before you give it.

## 4 Schedule and Deadlines

Month	Topic
September	Capstone journal talk third week of September.
October	Finalized written project plan Due October 1. Build apparatus, write computer code, and/or perform initial calculations. GRE subject test Oct. 18, 2008
November	Continue work and take initial data.
December	Progress Talk (Should include some preliminary results) first week of December.
February	First draft of first Chapter due February 2. Final data should be collected this month.
March	First draft of entire paper due March 13.
April	Final paper due April 9. Capstone presentation and defense last week of April.
<hr/> Written draft of two major sections of capstone paper Due Wednesday December 12 at 5pm.	