

➤ **Text:** *Interactive and Discovery Laboratory Experiments for Life Science Students*; available at a nominal cost in the physics lab storeroom. This includes a computer disk for the storage of experimental data, and a loose-leaf binder in which to store experiment notes, data, and summaries.

➤ **Course Content:** Selected experiments in mechanics will be performed. Emphasis will be on the interactive-discovery approach to experimental work in physics. The purpose of this is to give the student a more realistic laboratory experience. For example, this will entail the use of a lab notebook to keep a detailed record of weekly experimental work. Extensive use will be made of state-of-the-art computers and software. Students will be expected to perform in the laboratory setting all the work necessary to write a complete lab report.

*Students are to read the text and the instructions before coming to the laboratory in order to familiarize themselves with the experiment.*

➤ **Implementation:** As described below, unannounced five-minute quizzes on the material for the experiment will be given periodically at the beginning of the lab. *These quizzes will count toward the final grade.* Students will keep a weekly record of their experimental work in a loose-leaf binder. At the conclusion of each lab, a short summary of the results of that lab is to be entered at the beginning of that section in the lab notebook. The lab notebook is to be a personal, precise and concise record of your experimental work. This requires that the student perform these operations during the lab period. During the first half of the semester, your instructor will discuss the various aspects of writing a research paper (e.g. the abstract) such that by midterm (the week of October 3, 2005) a complete formal lab report will be submitted on an experiment to be determined by the instructor. *Each student is to submit his/her own report.* A second complete lab report will be submitted at the end of the semester, during the week of November 14, 2005. The laboratory will be available to the students at times other than the normal lab periods.

Since the use of computers will be an integral component of this course, the first several labs will involve an introduction to the various roles that the computer will play in the laboratory experience. This will include computations, graphical analysis, and word processing.

➤ **Goals:** In addition to the more traditional goals of observing and analyzing physical data relevant to some of the classical experiments in mechanics, upon the successful completion of this lab course, you should be proficient in the utilization of the computer as an integral component of the experimental apparatus. In addition to this you should have developed sufficient skill in the use of the data collection and analysis software *Data Studio*. Although you may not use *Data Studio* in future experimental work, it should serve as a useful prototype for other applications. Finally, and certainly of equal importance, you should have developed the skill to keep a detailed lab notebook, and with this write a clear, coherent scientific paper in which to present the results of your experimental work.

➤ **Grading:** The completed lab notebook will be a prerequisite for completion of the course requirements. This notebook will be reviewed during fall break, the week of October 10, 2005. Unannounced five-minute closed-notebook quizzes will be given periodically at the beginning of the lab period. *The final grade will be based equally upon the lab reports, lab performance, the lab notebook, the short quizzes, and, a lab final.* Since this lab course will emphasize in-house work, this evaluation of lab technique will be an important component of the final grade. All these aspects of the course will be discussed frequently so that all are well aware of the course expectations.

➤ **Office Hours:** T 10:30 - 11:30, Th 2:00 - 3:30, F 2:00 - 3:30. Other times by appointment. My office is M 367C, my extension is 94885 and my email is michael.hones@villanova.edu.

➤ **Lab Attendance:** An unexcused absence will have a serious effect on your final grade. *You will be allowed to make up only one experiment at the end of the semester and only at the discretion of the lab instructor.* This make-up lab will be the same for all students and is the last lab in the Table of Contents, *Kinetic and Static Friction*. It is strongly recommended that if you miss a lab for a *legitimate reason*, you should make up the missed lab during the same week at another regularly scheduled lab period.

➤ **Experiments:**

<b>Week of:</b>	<b>Experiment</b>
August 29	An Introduction to the Computer & Laboratory Analysis Techniques - I
September 12	An Introduction to the Computer & Laboratory Analysis Techniques - II
September 19	The Simple Pendulum
September 26	The Measurement of "g" and Error Analysis
October 3	Kinematics - I
October 17	Kinematics - II - <b>First Formal Report Due</b>
October 24	Free Fall: Galileo's Tour de Force
October 31	Newtonian Dynamics I - The Cart and Pulley on a Horizontal Plane
November 7	Newtonian Dynamics II - Atwood's Machine
November 14	Collisions: the Impulse-Momentum Theorem - <b>2nd Formal Report Due</b>
November 28	Hooke's Law; Elasticity and Periodicity
December 5	Make-Up - at the <i>discretion of the instructor</i> - Kinetic and Static Friction

**N.B.** There will be no labs during the weeks of September 5 (Labor Day and St. Thomas of Villanova Day) and November 21 (Thanksgiving).