This document may be revised.

PHY 111
Introduction to Engineering Physics I
Dillard University - Fall 2004

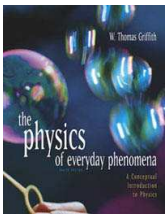
Meeting Times:

STERN 123 001	**M**	**1:00p- 2:50p**
STERN 123 901	**W**	**1:00p- 2:50p**

Instructor: **Rob Salgado** **Assistant Professor of Physics** Office: **Stern 307A** Voice: **(504)-816-4510**	E-mail: **rsalgado@dillard.edu** Instant-Messengers: AOL, MSN, Yahoo: **dillardphysics** (do *not* email here)	Office hours: **-to be announced**

Catalog Description:

PHY 111 Introduction to Engineering Physics I. (3 credits)
An introduction to engineering and physics to freshman students covering elementary physics (Mechanics and principles of problem solving physics), an introduction to engineering disciplines and their roles in society, and training in library and literature search. Class meets two hours per week for lectures and two hours per week for laboratory.



Required Textbook:

"The Physics of Everyday Phenomena: A Conceptual Introduction to Physics" (4th edition) by Thomas Griffith
(published by McGraw-Hill: ISBN: 0-07-250977-5)

Electronic Materials:

I will maintain a website (for now: **`http://physics.syr.edu/~salgado/111/`**) that lists the assigned problems and solutions. I will also try to make available the whiteboard/PowerPoint notes and any computer source code (e.g., Python, Maple) that I use for simulations or computations.

Course Goals:

A. To introduce basic concepts in physics, drawing examples from everyday phenomena.
B. To develop physical intuition, mathematical reasoning, and problem solving skills.
C. To prepare students for the necessarily rigorous sequence in physics and engineering.
D. To introduce students to research techniques [including laboratory experience, computer-based data acquisition and analysis, and the preparation and delivery of scientific presentations.]

Course Requirements:

Come to class **ON TIME**.
Attendance is **REQUIRED.**
"The University recognizes that a student may miss a class for legitimate reasons. In such cases these absences are excusable; however, the student must complete the Student Absence Form." An absence may be excused within 2 weeks of the absence using a form issued only by the Division of the Natural Sciences.
"A professor may drop a student with 3 or more unexcused absences from a course." (2003-2005 University Catalog, page 15)
Note that your attendance is recorded on the official midterm and final grade sheets.
"Academic dishonesty will not be tolerated." (2003-2005 University Catalog, page 15)
Come to class PREPARED and EQUIPPED, having read or written any assignments.
Treat each other with RESPECT. Limit all discussions to the PHYSICS topic under discussion.
Turn OFF all phones, pagers, radios, and other disruptive devices.

Course Procedure:

Two 110-minute meetings per week. Although the course is allocated with "lecture" on Mondays and "lab" on Wednesdays, we will not conform to that schedule. Lab-activities will be interspersed throughout the course.

Exams and Quizzes:

QUIZZES are given weekly. [No makeups or extensions. This will be strictly enforced. Be on time.]
There is a cumulative one-hour MIDTERM and a cumulative two-hour FINAL.
There are **no** makeup exams or quizzes. There are **no** exceptions. If you are absent for an exam or quiz, you have one week to obtain a Division excuse form. ***Only if*** that excuse is valid, **your final exam will carry the weight of your missed exam or quiz.**
Otherwise, you will get no credit for the missed exam or quiz.

Homework:

Homework will be assigned periodically but will not be collected. We will discuss some of the homework in class.
You are encouraged to consult the posted homework solutions and visit office hours to discuss the rest of the homework.
Exam and quiz problems are generally based on homework problems, textbook problems, and textbook examples.
Most of the learning you do in this course is done by your doing homework problems outside of class!
You are encouraged to work on the homework with other students.
However, be sure that you can do the homework problems *by yourself* since you'll be working on quizzes and exams *by yourself*.
If you need help with your homework, please visit me (with your textbook and your notebook and with proof that you have tried the problems) during Office Hours… the sooner the better.

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Grades:

20% QUIZZES (FORMAT: multiple-choice questions, a short problem, and vocabulary definitions)
20% LAB ACTIVITIES
20% MIDTERM EXAM (FORMAT: like many quizzes but cumulative)
20% PRESENTATION (FORMAT: short PowerPoint talk)
20% FINAL EXAM (FORMAT: like many quizzes but cumulative)

A≥88%, B≥76%, C≥64%, D≥50%, F<50%. This class is not graded on a curve.
Borderline cases (between two letter grades): If your exams show an upward trend, your grade may be nudged upwards.

Sequence of PHY 111 topics and the learning objectives: (Homework will be assigned during each chapter.)

Ch 1 Physics, the Fundamental Science (1 wk)
Distinguish "physics" from other disciplines. Discuss the importance of mathematics and units of measurement.

Ch 2 Describing Motion (2 wk)
Ch 3 Falling Objects and Projectile Motion (2 wk)
Distinguish velocity, acceleration, speed, and average velocity. Setup, algebraically- and geometrically-analyze, and physically-interpret simple constant-acceleration kinematics problems.

Ch 4 Newton's Laws: Explaining Motion (2 wk)
Define and explain Newton's Laws of Motion. Distinguish mass from weight. Setup (with Free-Body Diagrams), algebraically- and geometrically-analyze, and physically-interpret simple statics and dynamics problems.
Ch 5 Circular Motion, the Planets, and Gravity (1 wk)
Setup, analyze, and interpret simple circular-motion problems. Define and explain planetary motion using Kepler's Laws of Planetary Motion and Newton's Law of Universal Gravitation.

Ch 6 Energy and Oscillations (1 wk)
Ch 7 Momentum and Impulse (1 wk)
Distinguish force, energy, work, power, momentum, impulse. Setup, analyze, and interpret simple problems involving energy-conservation and momentum-conservation. Setup, analyze, and interpret simple-harmonic-motion problems.

Ch 8 Rotational Motion of Solid Objects (1 wk)
Distinguish rotational from translational kinematics and dynamics. Setup, analyze, and interpret rigid-body problems.

Assorted topics: (* time permitting)
Ch 13 Electric Circuits
Describe parts of a simple electric circuit. Setup, analyze, and interpret simple electric-circuit problems. Distinguish voltage, current, charge, power, resistance. Distinguish series arrangements from parallel ones. Distinguish DC circuits from AC ones.
Ch 15 Making Waves
Distinguish amplitude, frequency, wavelength, period, wave-speed, and phase-difference. Distinguish longitudinal waves from transverse ones. Describe wave-interference.
Ch 17 Light and Image Formation
Define and explain the Laws of Geometric Optics (reflection and refraction).
**Describe and analyze the formation of images (with mirrors and lenses).*
***Ch 18 The Structure of the Atom**
***Ch 19 The Nucleus and Nuclear Energy**

Some advice:

Physics is a **challenging** subject that requires your dedicated attention, but rewards you with skills that you can apply in ***any*** discipline!
Physics is **cumulative**: For example, understanding Ch 8 requires you understand all of the chapters before it.
You must not fall behind! If you find yourself falling behind, you must get some help. Visit the LEARNING CENTER in Stern 301!
Physics is written and spoken in a **Mathematical** language.
At this stage, Algebra, Trig, Geometry and Pre-Calculus are more important than Calculus. *Review your basic mathematics NOW!*
Physics is about "understanding **relationships** between physical quantities", which we uncover by experiment and by mathematical reasoning.
Physics is **NOT about formulas** and merely plugging-in numbers.
Formulas are often only "special cases of expressions of those relationships".
"Knowing a formula without knowing when it applies" is generally useless.
The act of "plugging-in numbers" measures your ability to do Arithmetic or use a calculator.
The resulting number is only useful when you interpret it physically. *"The right number with wrong physics" is just plain wrong.*
YOU CAN understand and succeed in Physics only if YOU put in the required work.
Just attending lectures and labs is not enough. Just taking good notes is not enough.
Just reading the textbook is not enough. Just memorizing formulas and definitions is not enough.
Just doing the homework is not enough. Just reading the solutions is not enough.
There are no shortcuts. ***YOU HAVE TO DO IT ALL.***

Some other highly-recommended texts you may wish to consult:

"Conceptual Physics" by Paul Hewitt
"Physics for Scientists and Engineers" (5th edition) by Raymond A. Serway and Robert J. Beichner