

SCI 101

Physical Science I

Dillard University - Fall 2004

Meeting Times:

STERN 321 T R 5:30a -- 6:45a
STERN 227 R 7:00p -- 7:50p

SCI 101 001
 SCI 101 901 L

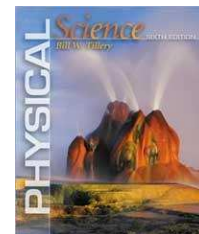
(You must be registered for the laboratory section.)

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
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Catalog Description:

SCI 101 Physical Sciences (4 credits)

Fundamental concepts and principles of the physical sciences integrated with procedures and methods of science.
 Three hours per week for lecture and two hours per week for demonstration laboratory.



Required Textbook:

“Physical Science (6th edition)” by Bill W Tillery
 (published by McGraw-Hill: ISBN 0072509783)

Electronic Materials:

I will maintain a website (for now: <http://physics.syr.edu/~salgado/sci101/>) 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 physical science, drawing examples from everyday phenomena.
- B. To develop physical intuition, mathematical reasoning, and problem solving skills.

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 75-minute lecture meetings and one 50-minute demonstration lab meeting per week.

I will try to integrate the demonstration lab with the lectures.

Exams and Quizzes:

In order to encourage you to keep up with the work **YOU** must do to learn the subject matter, **QUIZZES** may be given at any time, without warning. [No makeups or extensions. This will be strictly enforced. Be on time.] After every two or three chapters, we will have an announced **EXAM** on these chapters. 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.

Grades (for the lecture portion), roughly weighted as follows:

25% QUIZZES (FORMAT: conceptual and computational multiple-choice questions and vocabulary definitions)

25% REGULAR EXAMS (FORMAT: many conceptual and computational multiple-choice questions)

20% MIDTERM EXAM (FORMAT: like a regular exam but cumulative)

30% FINAL EXAM (FORMAT: like two regular exams but cumulative)

Approximately 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 SCI 101 topics and the learning objectives: (Homework will be assigned during each chapter.)

PHYSICS portion

Ch 1 What Is Science?

Distinguish “science” from other disciplines. Discuss the importance of mathematics and units of measurement.

Ch 2 Motion

Distinguish velocity, acceleration, speed, and average velocity.

Define and explain Newton’s Laws of Motion. Distinguish mass from weight.

Ch 3 Energy

Distinguish force, energy, momentum, impulse.

Distinguish kinetic energy, potential energy, work, power.

Ch 4 Heat and Temperature

Distinguish temperature from heat. Define and explain the concept of Absolute Zero.

Distinguish specific heat and latent heat. Distinguish methods of heat transfer: convection, conduction, and radiation.

Define and explain the Laws of Thermodynamics.

Ch 5 Wave Motions and Sound

Distinguish amplitude, frequency, wavelength, period, wave-speed, and phase-difference.

Distinguish longitudinal waves from transverse ones. Distinguish reflection from refraction. Describe wave-interference.

Ch 6 Electricity

Describe the electric field and the magnetic field. Describe parts of a simple electric circuit.

Distinguish charge, current, voltage, resistance.

Ch 7 Light

Define and explain the Laws of Geometric Optics (reflection and refraction).

Describe and analyze the formation of images (with mirrors and lenses).

Distinguish the wave-model and the particle-model of light.

CHEMISTRY portion

Ch 8 Atoms and Periodic Properties

Describe the parts of the atom. Describe the Bohr model and the Periodic Table.

*Ch 9 Chemical Bonds

Distinguish an atom from a compound. Distinguish ionic bonds from covalent bonds.

*Ch 10 Chemical Reactions

Describe chemical formulas. Describe chemical reactions.

(* Time-permitting)

Some advice:

Physical science is a **challenging** subject that requires your dedicated attention, but rewards you with skills that you can apply in **any** discipline!

Physical science 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!*

Physical science is about “understanding **relationships** between physical quantities”, which we uncover by experiment and by mathematical reasoning.

Physical science 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 science” is just plain **wrong**.*

YOU CAN understand and succeed in this class 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.**