

GENERAL COURSE SYLLABUS
TROY STATE UNIVERSITY
TROY CAMPUS
Updated: Spring 2003

SCI 2233 -- PHYSICAL SCIENCE

TEXT: *Physical Science*, Latest Edition. Tillery. McGraw Hill.

COURSE DESCRIPTION

Basic chemistry and physics for non-science majors.

CO-REQUISITE

SCI L233 Physical Science Lab

COURSE OBJECTIVES

Upon completion of this course, the student will

1. Understand the scientific method as it applies to concepts in chemistry and physics.
2. Apply basic concepts of chemistry and physics.
3. Appreciate the evolving nature of the disciplines of chemistry and physics and the tentative nature of models and theories in these disciplines.
4. Use critical thinking and problem solving strategies in the application of basic concepts of chemistry and physics.

COURSE CONTENT

1. Introduction to Physical Science
 - a. Nature of Physical Science
 - b. "Scientific Method"
 - c. Metric system of measurement
2. Motion and Gravitational Force
 - a. Speed and velocity
 - b. Accelerated motion
 - c. Theory of motion
 - d. Projectile motion
 - e. Newton's Laws of motion
 - f. Gravitational force
3. Momentum, Work and Energy
 - a. Momentum, impulse, conservation of momentum
 - b. Work
 - c. Power
 - d. Kinetic energy
 - e. Potential energy

- f. Conservation of energy
 - g. Temperature and its measurement
 - h. Temperature and heat
 - i. Changes of state
 - j. Heat transfer
 - k. Energy conservation
4. Electricity and Magnetism
- a. Electrostatics
 - b. Forces between electric charges
 - c. Magnetic poles and forces
 - d. Electric current
 - e. Electric power and energy
5. Wave Motion
- a. Wave concept
 - b. Transverse and longitudinal waves
 - c. The Doppler effect
 - d. Reflection, refraction, and diffraction
 - e. Superposition of waves, interference
 - f. Intensity and loudness
 - g. Light and other electromagnetic waves
 - h. Velocity of light
 - i. The electromagnetic spectrum
 - j. Color
6. The Quantum Theory of Matter and Radiation
- a. Spectroscopy
 - b. Balmer's formula and the hydrogen spectrum
 - c. The electron
 - d. X-Rays
 - e. Radioactivity
 - f. Rutherford model
 - g. Planck's quantum hypothesis
 - h. Photoelectric effect
 - i. Bohr's energy level atom
 - j. Laser
7. Atomic Structure and the Periodic Table
- a. Elements and their symbols
 - b. Atomic numbers, atomic masses, isotopes
 - c. The periodic table
 - d. Wave mechanics
 - e. Building up the periodic table
8. Chemical Bonding, Formulas, and Equations

- a. Ionic bond
 - b. Covalent bond
 - c. Polar molecules
 - d. Metallic bond
 - e. Chemical compounds and formulas
 - f. Oxidation numbers
 - g. Writing chemical formulas from oxidation numbers
9. Water and Solutions
- a. Properties of water
 - b. Solutions
 - c. Suspensions and colloidal systems
 - d. Acids and bases

COURSE REQUIREMENTS

Students are expected to attend lectures, complete assignments, and participate in class discussion.

ADDITIONAL SERVICES: AMERICANS WITH DISABILITIES ACT: Any student whose disabilities fall within ADA must inform the instructor at the beginning of the term of any special needs or equipment necessary to accomplish the requirements for this course.

Students who have or may be dealing with a disability or learning difficulty should speak with the instructor, contact the Office of Adaptive Needs Program (Trojan Center 215), or call 670-3220/3221. Various accommodations are available through the Adaptive Needs Program. The faculty in the School of Business makes every effort to accommodate unique and special needs of students with respect to speech, hearing, vision, seating, or other possible disabling conditions. Please notify the instructor as soon as possible of requested accommodations or ways to help.

CHEATING POLICY: The SGA and the Board of Trustees have approved a TSU Honor Code. The University has adopted a firm policy for incidents of academic dishonesty with potentially severe and long-term consequences for violators. All exams and outside work are to be considered as individual assignments unless instructed otherwise in writing. No unauthorized [i.e., by the instructor, beforehand] assistance may be given or received on any work submitted for grading. Giving unauthorized assistance is also considered “cheating”. The first incident will result in no credit for that assignment and the second incident will result in failure in the course. Students should be aware of the TSU Honor Code, the Academic Code, and the Penalties for Misconduct as published in the Oracle [available online from TSU homepage]. A friendly note of caution: my operational definition of plagiarism is five or more words used together by a second author in the same sequence as presented by their first author, without attributing the idea to the first author. Ideas and theoretical concepts should be attributed to their originator. Using quotation marks for longer strings of words is required. The consequences for plagiarism are harsh: one small occurrence, one letter grade, two small occurrences, two letter grades, etc. However, a single flagrant attempt at deception, once discovered, will

result in an automatic failure in the course. You must give your work credibility by citing credible references in support of premises, facts, and expert opinions. In three words: Prudence, Credibility, and Integrity.

ATTENDANCE POLICY

University Policy - In registering for classes at the university, ...students accept responsibility for attending scheduled class meetings completing assignments on time, and contributing to class discussion and exploration of ideas.

A student will be excused for class absence for circumstances beyond the student's control or if the student has been required to attend an activity sponsored by the university. Faculty members who sponsor activities that require class absences must send a list of student names to each member concerned at least three days before the scheduled absence.

Faculty Policy - Faculty members may levy academic penalties upon *un-excused* absences; however, such penalties for *un-excused* absences will be a part of each course syllabus and will be distributed to each class at the beginning of each term, and a copy filed in the departmental office.

INCOMPLETE WORK POLICY

Incomplete grades are assigned at the discretion of the instructor. Students should refer to the appropriate bulletin for policies regarding the removal of incomplete grades.

GRADING POLICY

Grades will be assigned according to academic regulations in the *Bulletin*.

EVALUATION

Quizzes and exams will be given. Additional assignments will be given and evaluated as deemed appropriate by the instructor. A comprehensive final examination will be given at the end of the course. Evaluation and assignment of grades will be consistent with each individual faculty member's syllabus.

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SCI L233 -- PHYSICAL SCIENCE LABORATORY

TEXT: *Laboratory Manual*, latest edition. Tillery. McGraw-Hill.

COURSE DESCRIPTION

Laboratory experiments in basic chemistry and physics.

COREQUISITE

Physical Science Lecture (SCI 2233)

COURSE OBJECTIVES

Upon completion of this course, the student will

1. Understand how to collect and interpret scientific data.
2. Apply the scientific method in hands on experiments in the physical sciences.

COURSE CONTENT

1. Mathematical and statistical techniques.
2. Measurements of length and time; speed and velocity calculations.
3. Free fall.
4. Newton's Second Law.
5. Simple pendulum.
6. Velocity of Sound in air.
7. Standing waves on strings.
8. Temperature scales and measurements.
9. Calorimetry.
10. Atomic spectra.
11. Structure of the atom; nature of particles and waves.
12. Molecular structure.
13. Acids and bases.
14. Other selected experiments.

COURSE REQUIREMENTS

Students are expected to attend all laboratory sessions. Make-up laboratories will be allowed only for excused absences.

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EVALUATION

Students are evaluated by their performance on laboratory reports of data collection and analysis, and /or instructor exams.