

## COURSE PROFICIENCY OUTLINE ADVANCED PLACEMENT

### PHYSICS -1374

5 Credits

#### Purpose

Advanced Placement Physics is a college level physics course taught in a high school setting. The student is expected to have shown excellence in previous courses in physics, chemistry and higher mathematics. The student will be able to receive college-advanced placement upon completion of the course and recommendations from the high school, College Entrance Examination Board, and the college. Admission to this course will be in accordance with recommendations by the Commission on Advanced Placement. Students electing the course shall take the Advanced Placement Test.

The course is a continuation and intensification of the work begun in first year physics; classical, as well as modern physics will be studied and mathematical applications will be stressed. Laboratory activities will also be emphasized.

#### I. Student Outcomes 5.1, 5.2, 5.3, 5.4, 5.7

- A. Students will demonstrate an understanding of the terminology, facts, concepts, and applications of standard high level college freshmen physics.
- B. Students will demonstrate the ability to utilize higher level mathematics to understand physical relationships.
- C. Students will demonstrate an understanding of physics and technology as related to daily life and the interrelationships of humans, resources, energy and the environment.
- D. Students will utilize already attained competencies in science critical-thinking skills, study and learning skills, reading, writing, listening and organizing skills, high level problem-solving skills, and laboratory manipulative and investigative skills, and further these college level learning skills.

#### II. Content 5.1, 5.2, 5.3, 5.4, 5.6, 5.7, 5.9

- A. Mechanics
  - 1 Introduction
  - 2 One Directional Motion
  - 3 Two Directional Motion with Vectors
  - 4 Laws of Motion
  - 5 Work and Energy
  - 6 Momentum and Collisions
  - 7 Circular Motion and the Law of Gravity
  - 8 Rotational Equilibrium and Dynamics
  - 9 Solids and Fluids
- B. Wave Motion
  - 1 Vibrations
  - 2 Sound

- C. Electricity and Magnetism
  - 1 Electric Forces and Fields
  - 2 Electrical Energy and Capacitance
  - 3 Current and Resistance
  - 4 Direct Current Circuits
  - 5 Magnetism
  - 6 Induced Voltage and Inductance
  - 7 Alternating Current Circuits and Electromagnetics
- D. Light and Optics
  - 1 Reflection and Refraction of Light
  - 2 Mirrors and Lenses
  - 3 Wave Optics
  - 4 Optical Instruments
- E. Modern Physics
  - 1 Quantum Physics
  - 2 Atomic Physics
  - 3 Nuclear Physics

III. Activities and Materials

- A. Text - Serway & Faughn - College Physics
- B. Classwork
  - 1 Lectures, note-taking, discussions, demonstrations, problem-solving development, formula and equation writing, audio-visual materials and regular tests and quizzes will be utilized.
  - 2 College level skills in reading, writing, listening and note-taking, problem-solving, information processing, reporting and interpreting, and science-learning will be utilized.
- C. Laboratory activities
  - 1 Simulations
  - 2 Graphics and vectors
  - 3 Setting up and handling laboratory apparatus with measurement equipment for all of the major physics content areas.
  - 4 Studies to develop scientific skills, critical thinking skills, quantitative relationships.
  - 5 Studies of physics principles and their applications
  - 6 Experiments using interfaced computers to gather data and aid in interpretations.
- D. Assignments - to be checked and reviewed by the teacher and students utilizing freshmen college reading, writing, organizational and process thinking skills and problem-solving techniques and skills.
  - 1 Readings - text and other sources, outlining and the organization of information
  - 2 Written answers to questions
  - 3 Problem-solving practice
  - 4 Laboratory and other reports utilizing various techniques and methods
  - 5 Science study-learning assignments

IV. Evaluation

- A. Students will be expected to complete classwork and homework learning assignments, laboratory work and reports, and make up work missed whenever it is practical to do so.
- B. Students will be expected to demonstrate a high level of proficiency in all of the goals and objectives of the course within the previously defined content and process areas.
- C. The evaluation of student proficiencies shall consist of tests and quizzes, written assignments and reports, lab reports and the teacher's regular observations of the students' proficiencies, involvement and learnings in laboratory activities and in the classroom environment.
- D. The final grade represents the teacher's professional judgment of the student's performance and all of the aforementioned activities and/or requirements are included in the evaluative process.
- E. The C.E.E.B. Advanced Placement Physics exam shall be taken during the month of May.

