

Department of Physics Course No. GI626  
Title of Course: AP Institute: Physics  
*GI626 Syllabus*

I. Catalog Description and Credit Hours of Course:

An institute designed to prepare high school physics teachers to offer Advanced Placement Physics in their schools. Two-week session has 32 hrs a week of lecture and lab. 3 credit hours.

II. Prerequisites: Certified Physics Teacher

III. Objectives of the Course:

A. To prepare participants to teach AP Physics in their high schools.

B. To review and reinforce the basic concepts and principles of physics, including mechanics, heat, kinetic theory, thermodynamics, electricity, magnetism, waves, geometric optics and modern physics. Laboratories and student projects will be emphasized.

IV. Expectations of Students:

To attend class and participate in all laboratory work.

V. Course Outline:

The workshop will cover the topics of the Advanced Placement Physics course. Emphasis will be placed on laboratories and topics in the AP "B" Physics course.

A listing of the major topics are:

A. Mechanics

1. Kinematics
2. Newton's Laws
3. Work, energy and power
4. Momentum and rotation
5. Oscillations and gravitation

B. Heat, Kinetic Theory, and Thermodynamics

1. Heat and temperature
2. Kinetic theory and thermodynamics

### C. Electricity and Magnetism

1. Coulombs laws and potentials of point charge
2. Field and potentials of various charge distributions
3. Gauss's law
4. Electric circuits
5. Electromagnetism

### D. Waves and Optics

1. Wave motion
  - a. mechanical waves
  - b. sound waves
2. Geometric Optics

### E. Modern Physics

1. Atomic physics and quantum effects
2. Nuclear physics
3. Special relativity

The laboratories will be based on the microcomputer based laboratories materials developed through the American Association of Physics Teachers by Dr. Priscilla Laws.

### VI. Textbook:

AP Physics Course Materials and Physics, 4th edition by Cutnell and Johnson, 1997, John Wiley & Sons, Inc., New York, New York.

### Laboratory Materials:

MBL materials by Dr. Priscilla Laws and material written at Southeast Missouri State University by Drs. Richard Cannon and Joseph Paikeday.

### VII. Basis for Student Evaluation:

- A. Participation in classroom activities
- B. Completion of laboratory experiments