

PHY 252
GENERAL PHYSICS II

COURSE DESCRIPTION:

PHY 252

II. Gauss' law

- A. Electric flux
- B. Gauss' law
- C. Application of Gauss' law to charged insulators
- D. Conductors in electrostatic equilibrium

III. Electric potential

- A. Potential difference and electric potential
- B. Potential differences in a uniform electric field
- C. Electric potential and potential energy due to point charges
- D. Electric potential due to continuous charge distributions
- E. Potential of a charged conductor

IV. Capacitance and dielectrics

- A. Definition of capacitance
- B. Calculation of capacitance
- C. Combinations of capacitors
- D. Energy stored in a charged capacitor
- E. Capacitors with dielectrics

V. Current and resistance

- A. Batteries
- B. Electric current
- C. Resistance and Ohm's law
- D. Resistivity

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- IX. Faraday's law
 - A. Faraday's law of induction
 - B. Motional EMF
 - C. Lenz' law
 - D. Induced EMF's

- X. Inductance
 - A. Self-inductance
 - B. RL circuits
 - C. Energy in a magnetic field
 - D. Oscillations on an LC circuit

- XI. Alternating-Current circuits
 - A. Resistors, inductors and capacitors in an AC circuit
 - B. The RLC series circuit
 - C. Power in an AC circuit
 - D. Resonance in a series RLC circuit

- XII. Electromagnetic waves
 - A. Maxwell's equations and Hertz's laws
 - B. Plane electromagnetic waves
 - C. Energy and momentum of electromagnetic waves
 - D. The electromagnetic spectrum

- XIII. Light and Geometric Optics
 - A. The nature of light
 - B. Measurements of the speed of light
 - C. Huygens's principle
 - D. Ray approximations
 - E. Reflections and refraction
 - F. Images formed by mirrors and refraction
 - G. Thin lenses
 - H. Optical devices

- XIV. Interference of light waves
 - A. Conditions for interference
 - B. Young's double-slit experiment
 - C. Phasor addition of waves
 - D. Phase change due to reflection
 - E. Interference in thin films

- XV. Diffraction and polarization
 - A. Introduction to diffraction
 - B. Single-slit diffraction
 - C. Resolution
 - D. The diffraction grating
 - E. Polarization

REQUIRED TEXTBOOK AND MATERIALS:

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Knight, R. D. Physics for Scientists and Engineers, with Modern Physics. 2nd ed. San Francisco, Addison Wesley, 2004.

Knight, R. D., Student Workbook with Modern Physics. 2nd ed. San Francisco, Addison Wesley, 2004.

Programmable scientific calculator.

SUGGESTED REFERENCES, PERIODICALS, AND VISUAL AIDS:

Numerous supplementary texts, programmed materials, and audiovisual packages are available in the Educational Resources Center. These materials may be utilized to reinforce the lecture and lab material or to provide material for independent study by the student.

STATEMENT OF STUDENTS WITH DISABILITIES:

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