

PHYSICS 205
MODERN PHYSICS FOR MEDICAL SCIENCES
(3.0; 3 Credits)

Textbook: College Physics
By: Serway & Faughn
Fifth Edition, 1999
(Saunders College Publishing)

Contents:

ELECTRICITY AND MAGNETISM

Electricity:

Charges, the electrostatic force, electrostatic potential energy, potential energy, potential difference, the electric field, Gauss's law, membrane potentials, electric current. Electrical resistance, capacitance, electric power, Kirchhoff's rules, measurement of current and voltage, bridge circuits.

Electromagnetism:

Magnetism, electromagnetism, effects of magnetic fields, magnetic materials, electromagnetic induction, electromagnetic, blood Flowmeters.

Applied Electromagnetism :

Electric Circuits, capacitance and inductance in DC currents, effects of electric current in the human body, electric devices, alternating current, AC circuits, electronics.

MODERN PHYSICS

Relativity:

The basis of relativity, time and length in special relativity, mass and energy.

Atoms:

- Radiation and quanta, photoelectric effect, wave particle duality, compton effect, quantum mechanics.
- Atomic models, the hydrogen atom, atomic shell structure, atomic radiations, medical uses of lasers, x-rays.
- Molecular bonds, molecular spectroscopy, crystals.

Nuclei:

Nuclear masses, stability of nuclei, radioactivity, nuclear reactions, fission and fusion, radioactive dating , biological effects of radiation, applications of radioactive isotopes.

N.B. Prerequisites: Physics 103.

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