# PHYSICS 212
# MODERN PHYSICS
## (3.0; 3 credits)

**Textbook :** Modern Physics
By: J.R. Taylor & C D Zafiratos
Berkeley (Prentice Hall)

**Contents:**

**1. The special theory of relativity :**
Geometry of spacetime, Galilean and Lorentz transformations, length and time in relativity, energy and momentum and relativistic dynamics with application to elementary particles.

**2. The Quantum effects:**
-The particle aspects of electromagnetic radiation:
photoelectric effects, Compton effect, Bremstrahlung, pair production and annihilation.

-The hydrogen atom: Tutherford scattering, atomic spectra, the Bohr atom, Frank-Hertz experiment, hydrogen atom wave functions.

-The wave aspects of particles:
De Broglie hypothesis, electron diffraction, uncertainty principle.

-The Schrodinger equation: The infinite well, harmonic oscillator and finite barries.

**3. Atomic Physics**
-Many electron atoms: angular momentum, spin, the periodic table, Zeeman effects, molecular spectra.

**4. Nuclear Physics :**
Nuclear constituents, binding energies, radioactivity, nuclear reactions, fission and fusion.

**5. Elementary Particles**

**Fall 2000**