1- Electricity & magnetism

CHAPTER (1) : GRAVITATION INTERACTION

* Kepler's Laws
* The Law of gravitation
* Gravitational Field (4 h)

CHAPTER (2) : ELECTRIC INTERACTION

* Electric charge
* Coulomb's Law
* Electric field and Electric potential
* Energy relations in an Electric field
* Electric Current (10 h)

CHAPTER (3) : MAGNETIC INTERACTION

* Magnetic force on a moving charge
* Motion of a charged particles in a magnetic field
* Magnetic field produced by closed current
* Magnetic field of a moving charge
* Forces between Currents (10 h)

CHAPTER (4) : ELECTRIC STRUCTURE OF ATOMS

* Electrolysis
* The Nuclear model of atom
* Bohr's theory of the atom
* Conductors , Semiconductors , and Insulators (8 h)

CHAPTER (5) : STATIC ELECTROMAGNETIC FIELD

* Flux of a vector Field
* Line integral and circulation of a vector field (20 h)

I / * Electromotive force
* Gauss' Law for the electric field
* Properties of a Conductor Placed in an electric field
* Electric Polarization of matter
* Electric Properties of matter
* Electric Capacitance
* Capacitors
* Energy of the electric field

II / *Ampere's Law for the magnetic field
* Magnetic flux
* Magnetization of matter
* Magnetic Susceptibility and permeability

CHAPTER (6) : TIME_- DEPENDENT ELECTROMAGNETIC FIELDS

* Faraday – Henry law

* Electromagnetic induction
* Self induction
* Ampere- Maxwell law
* Maxwell s equations (6 h)

CHAPTER (7) : ELECTRIC CIRCUITS

* Ohm's Law
* Electric power
* Combination of resistors
* Direct Current Circuits
* Methods for Calculating the Currents in an electric network
* Establishment and decay of a Current in a Circuit with self-inductance
* Free electrical oscillations (10 h)

CHPTER (8) : WAVE MOTIONS

* The general equation of wave motion
* Elastic waves
* Pressure waves
* Surface waves
* Group Velocity
* Doppler effect
* Sound , a coustics (12 h)

CHPTER (9) : ELECTROMAGNETIC WAVES

* Plane Electromagnetic waves
* Propagation of electromagnetic waves in matter
* Spectrum of electromagnetic radiation
* Interaction of electromagnetic radiation with matter (10 h)