

Curriculum

Class : General Science

Subject : Physics

Teacher's name : Ziad Mina

Cycle : Secondary

Textbook : National Textbook

Coordinator : Dr. Jamal Bitar

HOD : Miss Wafa Bitar

Unit	Objectives
<p>Unit 1 : Mechanics</p>	<ul style="list-style-type: none"> • Define the macroscopic mechanical energy • Explain the notion of internal energy of a system • Define the total energy of a system • Know the expression for the elastic potential energy of the system (spring – body) • Apply the conservation and the non conservation of the mechanical energy • Define the linear momentum of a particle and the linear momentum of a system of particles. • Know the relation between the linear momentum of a system of particles and the linear momentum of its center of mass • Know the expression of Newton's second law in terms of the linear momentum • Apply the law of conservation of the linear momentum • Define the angular momentum of a system rotating about an axis • Apply the relation between the angular momentum and the angular velocity • State the theorem of angular momentum • State the law of conservation of angular momentum • Apply the law of conservation of the angular momentum • Define oscillatory phenomena and give examples of oscillators • Distinguish between damped and un-damped oscillations • Establish the differential equation that governs simple simple harmonic motions • Give examples of the driven mechanisms of a damped oscillator • Characterize forced oscillations • Know the conditions of resonance • Give practical examples of forced oscillations with and without resonance

Unit 2 : Electricity

- Know the phenomenon of electromagnetic induction
- State and apply the laws of induction
- Define the equivalent generator of a coil
- Know the power distribution of a coil-magnet system
- Explain the function of alternators
- Define the phenomenon of self-induction
- Define the inductance of a coil
- Give the expression of self-induced electromotive force
- Write the expression of the potential difference across a coil
- Read the graphs of the growth and the decay of a current in an R-L series circuit
- Establish the differential equations of the growth and the decay of the current in an RL series circuit and give their solutions.
- Know the physical significance of the time constant
- Give the expression of the magnetic energy stored in a coil
- Interpret the spark produced when switching off a circuit
- Define the alternating sinusoidal current
- Apply Ohm's law to a resistor traversed by an alternating sinusoidal current
- Study the RL series circuit when traversed by an alternating sinusoidal current
- Explain the phenomenon of charging and discharging of a capacitor under a square signal and alternating sinusoidal voltage, and establish the corresponding differential equations.
- Establish the differential equation of an RLC series circuit traversed by an alternating sinusoidal current.
- Define the average power and the power factor.
- Define and describe a transformer
- Explain the functioning of a transformer
- Give the expression of the efficiency of a transformer
- Justify the usage of a transformer for transmission of electric energy
- Analyze the energy exchanges in an RLC series circuit
- Define the charging and discharging phases of a capacitor in an RLC series circuit

	<ul style="list-style-type: none"> • Give the expression of the natural period of an ideal LC circuit • Analyze an RLC series circuit under forced oscillations • Give the conditions of electric current resonance
<p>Unit 3 : Aspects of Light</p>	<ul style="list-style-type: none"> • Know Huygens principle • Interpret the diffraction phenomenon of light • Read the graph of light intensity in a diffraction pattern • Know the characteristics of light waves • Know the phenomenon of interference of light • Know the conditions of obtaining interference fringes • Interpret the formation of interference fringes • Give the expressions of the path difference and the inter-fringe • Define the photoelectric effect • State Planck-Einstein's hypothesis • Interpret the photoelectric effect using the Planck-Einstein's hypothesis

Unit 4 : Atom , Nucleus and Universe

- Know the historical development of the model of the atom
- Know that the atom has discrete energy levels
- Draw the energy level diagram of the hydrogen atom
- Differentiate between emission and absorption spectra
- Distinguish between coherent and non-coherent light
- Know the principle of laser emission
- Represent the nucleus.
- Define the atomic mass unit
- Define the isotope of an element
- Explain the concept of binding energy
- Explain the stability of the nucleus
- Explain the radioactive disintegration
- Characterize the radioactive radiations
- Define the activity of a radioactive element
- Define the period of a radionuclide
- State the law of radioactive decay
- Know the principle of artificial radioactivity
- Know the existence of some natural radioactive series
- Know the principle of nuclear fission & nuclear fusion
- Explain the chain reaction
- Apply the law of conservation of energy in a nuclear reaction
- Identify nuclear waste