

Syllabus

▪ **Linear Motion And Rotation Motion**

- Average Velocity
- Instantaneous Velocity
- Acceleration
- Rotation Angle
- Angular Velocity
- Angular Acceleration
- Relating the Linear and Angular Variables

▪ **Heat and Cold in Medicine**

- Heat , Temperature, Heat transfer
- Difference between heat and temperature
- Types of thermometers
- Thermometry and temperature scales
- Thermal Energy
- Heat Transfer
- Thermograph
- Physical Methods of Producing Heat in the Body
- Cryosurgery

▪ **Optical Microscopes**

- What is Wave Motion
- Classification of Wave Motion
- Properties of waves
- Interference definition
- Types of Interference
- Diffraction of Light
- Polarized Light
- What are Lenses
- Convex lenses
- Concave lenses
- What are Microscopes
- Optical parts of a microscope and their functions
- How do the lenses in a microscope work
- Compound Light Microscope
- Resolution (or resolving power)

- The Airy Disk and Microscope Resolution
- Depth of Field and Image Depth

- **Electrical signal from the heart- the electrocardiogram**
 - Structure of the heart
 - How does blood flow through the heart?
 - What are diastole and systole in blood pressure
 - The heart's electrical system
 - Electrocardiography
 - Main components of ECG
 - ECG & Electrodes

- **Fluid Mechanics**
 - Fluid Characteristics
 - Pressure difference
 - Osmotic pressure
 - Kinetic energy density
 - Potential energy density
 - Compressibility and Incompressibility
 - Viscous and Nonviscous
 - Types of flow
 - Fluid Flow and the Continuity Equation
 - Bernoulli's Equation
 - Applications of Bernoulli's equation
 - Manometer
 - Horizontal flow consequence
 - The Role of Gravity on blood circulation
 - Effect of acceleration on Blood pressure
 - Downward acceleration
 - Viscous Fluid Flow
 - Laminar Flow in a Tube
 - Poiseuille law

▪ **Introduction to Radioactivity and Nuclear Physics**

- Nuclear Radioactivity
- None Stable elements (radioactive)
- Decay " Transformation " Process
- Unit of Radioactivity
- Groups of isotopes according to their uses
- Biological Effects

▪ **Elastic Properties of Materials**

- Stress and Strain
- Types of Stress
- Strain
- Relation Between Stress and Strain
- Young's Modulus
- Deformation types and define an elastic modulus
- Bulk Modulus: Volume Elasticity
- Hook's Law
- Elastic Strain Energy
- Bone Fracture: Energy Considerations

▪ **Sound in Medicine**

- General Properties of Sound
- Types of ultrasound
- Acoustic Impedance
- Ultrasound interaction with tissue
- Ultrasound transducer
- Operational modes
- Doppler Ultrasound
- Biologic Effect