

Shiksha Mandal's
Bajaj College of Science, Wardha (Autonomous)
Syllabus for B. Sc. I (SEM-I) w.e.f. 2023-24
Generic Elective (GE-I)

Course Name: BASIC PHYSICS: CONCEPTS AND APPLICATIONS

(Credits: 02)

30 Lectures

Course Description: This generic elective course is designed for undergraduate students. It deals with basic understanding about the physical parameters, basic calculations and various phenomenon and applications in daily life that can be explained on the basis of concepts in Physics.

Course Objectives: The objectives of this course are to enable the student to :

1. Learn the basic concepts in Physics.
2. Perform the basic calculations and estimate the errors.
3. Understand the Physics behind various phenomenon occurring in nature.
4. familiarize with application of Physics in day to day life.
5. learn about commonly used electrical components and instruments in Physics.

Course Learning Outcomes (COs): Upon completion of this course students will be able to:

- **CO1.** Develop an understanding about Physical parameters in Physics and their units of measurement.
- **CO2.** Analyze a problem, perform mathematical calculation, estimate the error and do some statistical calculations.
- **CO3.** Develop the skills to handle the basic instruments.
- **CO4.** Understand the Physics concept behind various naturally occurring phenomenon, commonly used components, apparatus and meters in Laboratory.
- **CO5.** Learn about certain human body parameters and applications of Physics in daily life.

Course Content: (30 Lectures)

Unit I [10 Lectures]

Physical parameters, their SI and CGS units and inter conversation, type of errors, absolute, mean absolute, relative and percentage errors, Error due to addition, subtraction, multiplication and division, Statistical analysis: Mean , Median, Geometric Mean, Standard Deviation.

Resistance, Capacitance (in series & parallel), Inductance, Transformer, Semiconductor: intrinsic and extrinsic , Diode, Transistor, Galvanometers, Voltmeters, ammeter, multimeter ,Cathode Ray Oscilloscope.

Unit II [10 Lectures]

Force: Pressure, centripetal and centrifugal force, Torque , couples, Friction: causes of friction, Advantage & disadvantage , Reducing friction, Elasticity : Stress , Strain , Hook's law , Modulus of elasticity , Behaviour of metal wire with load, Applications of Elasticity, Fluids : Archimedes Principle, variation of pressure, Mercury Barometer, Bernoulli's principle and its application , velocity of efflux, Blood pressure , Surface tension Examples in daily life, Capillarity and its examples, Viscosity and its applications.

Unit III [10 Lectures]

Heat: Concept of temperature, Different scales of temperature and relation between them. Mercury thermometers, Examples of thermal expansion in daily life, heat energy, conduction, convection, Radiation, Clausius Clapeyron equation.

Optics : Nature of light , Electromagnetic spectrum, Snell's law , Interference, refraction, diffraction, Total internal Reflection and its Consequences, , some natural Phenomena's of light : Rainbow, scattering etc, Refraction by lens, Combination of lens, power of eye lens human eye, its defects and corrections.

Laboratory Sessions:

1. Estimation of error and percentage error in given calculation.
2. Statistical analysis of given data.
3. Identification of components and determination of their values.
4. Applications of multimeter.
5. Applications of CRO.

References:

1. A Textbook of Electrical Technology – B L Theraja (S Chand & Co.)
2. Enjoyable Physics Volume-1 Neil Chatterjee, Macmillan Publishers India Ltd.
3. Concepts of Physics, Part-1, H C Verma, Bharati Bhawan Publishers.
4. Concepts of Physics, Part-2, H C Verma, Bharati Bhawan Publishers.

Note: Mode of evaluation:

Continuous Internal Assessment (No end semester examination)(Poster presentation / Project/ Presentation/ Assignment/ quiz)

Total Mark: 100