

Shri Govind Guru University

GODHRA

Syllabus of

B. Sc. Semester - I

PHYSICS

(Based on NEP-2020)

Effective from August, 2023

B.Sc. – Semester -I (PHYSICS)

Major-1: BS23MJ1PH1 : PHYSICS(Credit -4)

UNIT -1: Introduction to Classical Mechanics

1. Vector Algebra

- 1.0 Introduction
- 1.4 Product of two vectors
- 1.6 Definition of a vector in terms of its component
- 1.11 Triple Scalar Product
- 1.12 Reciprocal Vectors
- 1.13 Triple Vector Product

2. Vector Analysis

- 2.1 Differentiation of Vectors with respect to a scalar
- 2.2 Differentiation with respect to time, Velocity and Acceleration
- 2.3 Integration of vectors
- 2.4 Partial differentiation
- 2.5 Gradient of a scalar point function
- 2.6 Divergence of a vector
- 2.7 The equation of continuity
- 2.8 Curl of a vector point function
- 2.14 Gauss' theorem
- 2.17 Stokes' theorem

➤ **Text Book: Introduction to Classical Mechanics** by R. G. Takwale & P. S. Puranik
(Tata McGraw-Hill Publishing Co. Ltd.)

❖ **Reference Book: Mathematical Methods in Physical Sciences** by M. L. Boas
Chapter 6 (John Wiley & Sons)

UNIT-2: Waves

1. Travelling waves

- 16.3 Speed of propagation of waves in a stretched string
- 16.4 Longitudinal waves in a bar
- 16.5 Plane waves in fluid
- 16.6 Transmission of energy by a travelling wave

2. Sound waves

- 18.1 Introduction
- 18.2 Intensity and Intensity level
- 18.3 Loudness and Pitch

- **TextBook: Mechanics, Wave motion & Heat** by - Francis Wetson Sears,
(Addision Wesley pub.)

3. Ultrasonics

- 23.1 Magnetostriction method
- 23.2 Piezoelectric oscillator
- 23.3 Piezoelectric detectors
- 23.4 Measurement of velocity of ultrasonic waves
- 23.6 The Ultrasonic waves & it's Uses

- **Text Book- A Textbook on Oscillations, Waves and Acoustics** by - M. Ghosh,
D.Bhattacharya (S. Chand and Company Ltd.)

UNIT-3: Optics

1. Fermat's Principle and its Applications

- 2.1 Introduction
- 2.2 Fermat's principle of least time
- 2.3 Rectilinear propagation of light
- 2.4 Reversibility of light rays
- 2.5 Laws at reflection
- 2.6 Laws of refraction

2. Interference in Thin Films

- 15.1 Thin film
- 15.2 Plane parallel film
 - 15.2.1 Interference due to reflected light
- 15.4 Haidinger fringes
- 15.5 Variable thickness (wedge-shaped) film
- 15.6 Newton's ring (15.6.1 to 15.6.9)

- **Text Book: A text book of Optics** by Dr. N. Subrahmanyam, Brijlal and Dr. M. N. Avadhanulu (S. Chand & Company Ltd.Publication)

UNIT-4: Electric and Electronic Circuits

1. Rectifying Circuits

- 2.2 Half wave rectifier
- 2.3 Voltage regulation
- 2.4 Ripple factor
- 2.8 Full wave rectifier
- 2.9 Bridge rectifier

2. Filter Circuits

- 3.1 The inductor filter
- 3.3 The capacitor filter
- 3.9.1 L-C filter
- 3.13 π filter
- 3.14 Comparisons of filter circuits

- **TextBook:** Electronic devices and circuits-an introduction by Allen Mottershead,
(Published by PHI Learning private Ltd., New Delhi)
