

VEER NARMAD SOUTH GUJARAT UNIVERSITY**Syllabus for B. Sc. Semester II****Subject: Physics (PHY-2001)****Paper – I****[2 credit course- 2 hours per week]****Unit – I****Duration: 15 hrs****(A) OSCILLATIONS AND WAVES**

Equation of simple harmonic waves (4.11), Differential equation of wave motion (4.12), particle velocity wave velocity (4.13), energy of progressive waves (4.15)

Laws of transverse vibrations in a string (7.3), verification of the laws of transverse vibrations of the string (7.4), Melde's experiment (7.5)

[*Waves and oscillations by Brij Lal and Subrahmanyam*]

(B) MODERN PHYSICS

What is light (2.4), X-rays (2.5), X-ray diffraction (2.6), Compton effect (2.7)

[*Concepts of Modern Physics by A Beiser*]

Unit – II**Duration: 15 hrs****PROPERTIES OF MATTER**

Bending of beams (8.29), the cantilever (8.30), depression of a beam supported at the ends (8.33), determination of Y by bending of a beam (8.34), determination of elastic constants by Searle's method (8.36)

[*Elements of Properties of Matter by D S Mathur, 11th ed*]

Note: Illustrative problems on all the relevant topics should be covered.

Reference books:

1. Oscillations & waves by H. J. Pain
2. Oscillations & waves by Brij Lal & Subrahmanyam
3. Oscillations & waves by Bajaj
4. Mechanics by Saty Prakash & Agarwal
5. Atomic & nuclear physics by J. B. Rajam
6. Atomic & nuclear physics by Brij Lal & Subrahmanyam
7. Modern physics by K. Crane
8. Modern physics by Murugesan
9. Introduction to Modern Physics by Richtmyer, Kennard, Cooper

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Veer Narmad South Gujarat University
Syllabus for B. Sc. Semester II
Subject: Physics (PHY-2002)
Paper – II
[2 credit course- 2 hours per week]

Unit – I

Duration: 15 hrs

(A) MAGNETISM

Law of force between two magnetic poles (7.2), magnetic field-lines and tubes of forces (7.3, 7.4), behavior of a magnetic substance in a magnetic field permeability induction (7.5), magnetic flux and flux density (7.5(a)), magnet in a magnetic field (7.6)
[*Fundamentals of magnetism & electricity by D. N. Vasudeva*]

(B) ELECTRONICS

Full-wave rectifier (17.8), filters (17.9), series inductor filter (17.10), shunt capacitor (17.11), LC filter (17.13), the CLC or Pi filter (17.14)
[*Basic electronics by B L Theraja*]

Unit – II

Duration: 15 hrs

(A) DIGITAL ELECTRONICS

Binary to decimal conversion (4.2), decimal to binary conversion (4.3), octal numbers (4.4), hexadecimal numbers (4.5)
[*Digital principles & applications by A P Malvino & Leach, Mc-graw hill int edition*]

(B) OPTICS

Fresnel's biprism (8.8), interference in thin films (8.15), interference due to reflected light (thin film) (8.16), fringes produced by a wedge-shaped thin film (8.21), Newton's rings (for reflected light only) (8.23), determination of the wavelength light using Newton's rings (8.24)
[*A textbook of Optics: Brij Lal and Subrahmanyam, 22nd ed*]

Note: Illustrative problems on all the relevant topics should be covered.

Reference books:

1. Introduction to Electrodynamics by D J Griffiths
2. Electromagnetism by Grant & Philips
3. Electricity & magnetism by Rangwala & Mahajan
4. Electricity & magnetism by Sehgal, Chopra & Sehgal

List of experiments
Semester – II

Group A	
1	Force constant (k) of a spring
2	Speed of transverse waves on a stretched wire of various linear densities using Sonometer
3	Elastic constants (Y, η, K & σ) by Searle's method
4	Melde's experiment
5	"Y" by cantilever
6	"Y" by bending of a beam supported at two ends & loaded in the middle

Group B	
1	Study of magnetic field due to Solenoid
2	Impedance of an LCR ac series network
3	Wattage of a lamp
4	Newton's rings experiment
5	Study of rectifiers
6	Zener diode as a voltage regulator

Note:

1. The duration of each experiment is of 2 hours. Two such experiments are to be performed by each student per week.
2. In the external exam, a student will have to perform two experiments, each experiment of 2 hours duration.
3. It is recommended that there will not be more than 20 students per batch in the external exam.