

Course Code	Course Name	Credits
26PH915	BASIC PHYSICS	04

Course Objectives

- Understand the behavior of electrostatics and electricity.
- Have knowledge about simple harmonic motions and reverberation time.
- Understand the concept of elasticity and the experimental determination modulus of a materials.
- Get clear idea about properties of electricity and digital electronics
- Acquire skill of solving related problems.

Learning Outcomes

Upon successful completion of this course it is intended that a student will be able to:

- Understand the basic properties of matter.
- Understand various sound related concepts.
- Understand the concepts about electricity and electromagnetic induction.
- Understand the thermal properties of materials.
- Understand the importance of semiconductors and basics of digital electronics.

Unit 1 - Properties of Matter (12 Hrs.)

Stress – Strain, Hooke's law – Elastic behaviour of a material – Different moduli of elasticity-Relation between elastic constants – Work done per unit volume in longitudinal strain -Poisson ratio - Expression for bending moment – Determination of Young's modulus by non-uniform bending and uniform bending.

Unit 2 – Sound (12 Hrs.)

Simple Harmonic Motion – Composition of two simple harmonic motion - Along a straight line and at right angles to each other. Acoustics of buildings- factors affecting architectural acoustics - Reverberation – Reverberation time – Sabine's formula- Conditions for good acoustics – Law of vibration of stretched strings – Sonometer.

Unit 3 - Electricity (12 Hrs.)

Kirchoff's law- Applications- Wheatstone bridge- Carey Foster's bridge-Laws of electromagnetic induction- Expression for induced E.M.F- Self-inductance- Determination of coefficient of self-inductance – Rayleigh's method- Solenoid: Mutual inductance of solenoid- Experimental determination of mutual inductance.

Unit 4 – Thermal Physics (12 Hrs.)

Newton's law of cooling – Verification – Specific heat capacity of liquid by cooling – Bomb calorimeter- Thermal conductivity of a bad conductor-Lee's disc method-Conduction & Coefficient of thermal conductivity – bad conductor. Stefan's law of radiation –Solar constant–Angstrom's pyrheliometer- Temperature of the sun.

Unit 5 - Electronics and Digital Electronics (12 Hrs.)

Semiconductors - Properties- Junction diode- Forward and reverse bias-V-I characteristics. Number systems – Decimal, binary, octal, hexadecimal and their mutual conversions-Binary arithmetic operations. Basic logic gates- AND, OR, NOT, NOR, NAND – NOR and NAND gate as universal gates, Laws of Boolean algebra- De- Morgan's theorems.

Reference Books:

1. BrijLal and N.Subrahmanyam, Textbook of Sound, Vikas Publications Pvt. Limited,(2000).
2. R.Murugesan, Properties of Matter, S.Chand and Co. New Delhi (1999).
3. BrijLal and N.Subrahmanyam, Heat and Thermodynamics ,S.Chand (1999).
4. R.Murugesan,ModernPhysics,S.ChandandcompanyLtd.,NewDelhi(2006).
5. D.S.Mathur, Elements of Properties of matter, Shyam Lal Charitable Trust, New Delhi(2005).
6. B.L. Theraja, Basic Electronics, S. Chand &Co, New Delhi(2008).
7. Anokh Singh, A.K.Chhabra, Fundamentals of Digital Electronics.

Websites and eLearning Sources:

1. http://www.csun.edu/science/courses/525/old_files/thinking/probsolv_physics.htm
2. <https://civilprojectsonline.com/building-construction/stress-strain-modulus-of-elasticity-and-elastic-materials/>
3. https://eng.libretexts.org/Bookshelves/Materials_Science/TLP_Library_I/07%3A_Bending_and_Torsion_of_Beams

COs and Bloom's Taxonomy Mapping – 26PH915

Course Outcomes	On successful completion of this course, students will be able to	BTL
CO1	Recall and explain fundamental concepts such as stress, strain, elasticity, SHM, and basic semiconductor properties.	K1, K2
CO2	Apply principles of elasticity, acoustics, electricity, and thermal physics to solve numerical and experimental problems.	K3
CO3	Analyze physical systems such as vibrating strings, electrical circuits, and heat flow mechanisms using theoretical models.	K4
CO4	Evaluate experimental methods like bending, bridges, calorimetry, and inductance measurements for accuracy and efficiency.	K5
CO5	Design simple experiments and electronic circuits using semiconductor devices and logic gates.	K6

BTL (Bloom's Taxonomy Level) - K1 – Remembering, K2 – Understanding, K3- Applying, K4 – Analyse, K5- Evaluate and K6 - Create

Relationship Matrix – 26PH915

Course Outcomes	Programme Outcomes (POs)						Programme Specific Outcomes (PSOs)						Mean Score of Cos
	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	
CO1	3	2	1	1	1	1	3	2	1	1	1	1	1.67
CO2	3	3	2	2	1	1	3	3	2	2	1	1	2.00
CO3	2	3	3	3	2	1	2	3	3	2	2	1	2.25
CO4	2	3	2	3	2	1	2	2	3	2	2	2	2.17
CO5	2	2	3	2	3	2	2	2	3	3	3	2	2.33
Total													2.08

Mean Score: 3- High, 2- Medium/Moderate, 1-Low

