

GANPAT UNIVERSITY

FACULTY OF ENGINEERING AND TECHNOLOGY (DIPLOMA PROGRAMMES)

Programme	Diploma Programme			Branch/Spec.	All				
Semester	I & II			Version	1.0.0.0				
Effective from Academic Year	2018-19			Effective for the batch Admitted in : June-2018					
Subject code	1BS123	Subject Name		Physics					
Teaching scheme					Examination scheme (Marks)				
(per week)	Lecture(DT)		Practical(Lab.)		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	3	0	1	-	4	Theory	40	60	100
Hours	3	0	2	-	5	Practical	30	20	50

Pre-requisites:

- Fundamental knowledge of primary science.

Learning outcomes:

- After successful completion of this course, student will be able to,
- *Understand essential knowledge of units and measurement.
 - *Recognize necessary information of Laws of motion and its applications.
 - *Comprehend important characteristic of phenomenon of elasticity.
 - *Appreciate vital knowledge of heat and thermodynamics.

Theory Syllabus

Unit	Content	Hrs.
1	UNITS AND MEASUREMENT : System of units (FPS, CGS, MKS, SI system), Derived physical quantities and their units, features Measuring Instruments: (1) Vernier Calipers (2) Micrometer Screw Gauge, Errors in measurements, Dimensions of physical quantity, Dimensional formula and dimensional equation, Dimensional analysis and its applications	5
2	MOTION, WORK AND ENERGY Concept of Position, length and Displacement, Average Speed and Average Velocity, Instantaneous Speed, Instantaneous Velocity, Acceleration, Kinematic equations for uniformly accelerated motion, Law of Inertia, Newton's First Law of motion, Momentum, Newton's Second law of motion, Impulse of force, Newton's Third law of motion, Conservation of momentum, Work, Kinetic Energy, Potential Energy, Work energy theorem, Power.	6
3	ELASTICITY: Elastic behavior of Solids, Stress and Strain, Stress-Strain curve, Hooke's law, Determination of Young's Modulus, Bulk modulus, Modulus of rigidity, Application of Elastic behavior of material	4
4	HEAT AND THERMODYNAMICS: Heat Conduction, heat convection and heat radiation, Thermal conductivity, Heat capacity and specific heat, Thermal Equilibrium, Zeroth law of thermodynamics, Temperature and internal energy, First law of thermodynamics, Isothermal, isobaric, isochoric and adiabatic process, Units of temperature and equations of their interrelation, Kelvin temperature scale	6
5	SURFACE TENSION AND FLUID DYNAMICS Cohesive and adhesive forces, molecular range, Definition, SI unit and dimension of surface tension, Angle of contact and Capillarity, shape of liquid meniscus in a capillary tube, Formula of surface tension, surface tension and surface energy, Effect of impurity and temperature on surface tension, Viscosity, Streamline flow and turbulent flow of a fluid, Reynolds number, Newton's formula for viscous force, co-efficient of viscosity, Stokes law and terminal velocity	7
6	STATIC AND DYNAMIC ELECTRICITY Introduction, Electric charge, Quantization of Charge, Coulomb's law, Electric field and electric field lines, Electric potential, Electric current, Ohm's law, Electrical Resistivity and Conductivity, Series and parallel connections of resistors.	5

7	RADIOACTIVITY AND NUCLEAR PHYSICS : Introduction to Radioactivity, Laws of Radioactivity, Half Life, and Average Life, Properties of alpha particles, beta particles and gamma rays, Nuclear fission, Chain reactions, Nuclear fusion, Nuclear reactor ,Waste disposal of nuclear reactor	6
8	OPTICS AND NANOTECHNOLOGY: Reflection of light, Total Internal Reflection, Refraction of light and Snell's law, Diffraction Polarization , Interference of light, Dispersion, Introduction to Nanotechnology, Nano scale and Surface to Volume ratio, Properties of nano materials, Application of nanomaterials.	6

SUGGESTED LIST OF EXPERIMENTS

The experiments should be properly designed and implemented with an attempt to develop different types of skills leading to the achievement of the competency -

Sr. No.	Unit no.	Experiment
1	1	To study the working of Vernier calipers.
2	2	To study the working of Micrometer screw gauge.
3	3	Measurement of refractive index of prism using spectrometer.
4	4	Measurement of gravitational acceleration using simple pendulum.
5	5	Measurement of force constant of elastic spring.
6	6	Measurement of resistance using Ohm's law.
7	7	Determination of viscosity of fluid using red wood viscometer.
8	8	Measurement of unknown resistance using Wheatstone bridge.
9	9	Measurement of Young's Modulus of a sample wire.
10	10	Study of SA/V ratio of simple objects.
11	11	Study of Stokes law.
12	12	Determination of surface tension of a liquid.
	Note	Minimum Ten Experiments should be performed by the students from the above given list or experiment related to above topics

SUGGESTED LEARNING RESOURCES

List of Books

Sr.No	Title of Books	Author	Publication
1	Applied Physics	Arthur Beiser	Tata McGraw- Hill publication
2	Fundamentals of Physics	David Halliday and Resnik	John Wiley & Sons publication
3	Nuclear physics	S.B.Patel	Anshan Ltd publication.
4	General Properties of matter	D. S. Mathur	S.Chand publication
5	Engineering Physics	G.Vijayakumari	Vikas Publishing House Pvt Ltd