

Semester – I/II

Subject Name: Applied Physics

Subject Code: 09GS2101

Diploma Branches in which this subject is offered: Mechanical Engineering, Electrical Engineering, Civil Engineering, Computer Engineering, Information and Communication Technology, Chemical Engineering

Objective: To prepare the students to have a basic knowledge of fundamental quantities, their units and measurement. To study various cases under laws of motion. To have knowledge of various properties of materials also to have knowledge of fundamentals of electricity and magnetism and to have knowledge about Light and Sound Waves.

Credits Earned: 3 Credits

Course Outcomes: After completion of this course, student will be able

1. To measure dimensions of various materials and compare units.
2. To understand and relate phenomena with the help of laws of motion.
3. To identify various states of materials and their relevance.
4. To understand the concept of Electricity and Magnetism and its application in daily life.
5. To get Knowledge about Light and Sound Waves and their applications.

Pre-requisite of course: Basic knowledge of science.

Teaching and Examination Scheme

Teaching Scheme (Hours)			Credits	Theory Marks			Tutorial/ Practical Marks		Total Marks
Theory	Tutorial	Practical		ESE	IA	CSE	Viva	Term Work	
2	0	2	3	50	30	20	25	25	150

Contents:

Unit No.	Unit title and content	Hours	Weightage
1	Units, Dimensions and Measurements	4	20%
	Definition of unit, Fundamental and Derived units, systems of units- CGS, MKS and SI, introduction to accuracy, precision and errors, types of errors, error analysis, Numerical on Error		
2	Laws of Motion	4	20%
	Inertia, Newton's first law of motion, momentum, Newton's second law of motion, conservation of momentum, Newton's third law of motion, Numerical on above topics		
3	Properties of Matter	6	20%
	Stress & strain along with their types, Hooke's law and modulus of elasticity-Young, bulk and modulus of rigidity, Viscosity, Newton's law of viscosity, types of flows, Reynold's number, surface tension and capillary action		
4	Electro-Magnetism	6	20%
	Current electricity: current, EMF and Ohm's law, resistance, series and parallel, Numerical on above topics Magnetism: Magnetic field and properties, electro-magnetic induction-self-inductance and mutual inductance, Faraday's law, applications-transformer		
5	Waves: Light & Sound	8	20%
	Light: Properties, Reflection, Refraction, Snell's law, Dispersion of light Sound: Characteristics – (Amplitude, Wavelength, Crest, Trough, Frequency, Time Period), Definition of Resonance with Examples, Formula for Velocity of Sound and factors affecting it, Ultrasonic Sound Waves – Uses, properties, Applications, Radioactive rays - Properties and uses of Alpha, Beta and Gamma particles.		

Suggested List of Experiments:

Sr. No.	Name of Topics	Contact Hours
1	Vernier Calipers To know the use of the Vernier Calipers and to measure the length, width and height of the given rectangular block.	2
2	Micrometer Screw gauge To measure the diameter of the small sphere using micrometer screw gauge.	2
3	To determine the value of acceleration due to gravity by using simple pendulum	2
4	To measure co- efficient of Static Friction of a given Surface	2
5	To determine Young's Modulus of elasticity of a given wire using Searle's Apparatus	2
6	To determine surface tension of a liquid by capillary tube using travelling microscope	2
7	To calculate refractive index of material of prism using Spectrometer Device	2
8	Demonstrate sound waves creating vibrations and observing their effect	2
9	To verify Ohm's Law	2
10	To study Resistors in series	2
11	To study Resistors in parallel	2
12	To verify Faraday's Law	2
Total		24

Instructional Method:

- The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by black board, may also use any of tools such as demonstration, role play, Quiz, brainstorming, MOOCs etc.
- The internal evaluation will be done on the basis of continuous evaluation of students in the laboratory and class-room.
- Practical examination will be conducted at the end of semester for evaluation of performance of students in laboratory.
- Students will use supplementary resources such as online videos, NPTEL videos, e-courses, Virtual Laboratory

References:

1. Halliday, Jearl Walker, and Robert Resnick, "Fundamentals of Physics", (New York and London: John Wiley & Sons, 1962)
2. Physics textbooks NCERT
3. P.G. Bhandarkar, "Applied physics", Nirali Publication
4. R.K. Gaur and S.I. Gupta, "Engg. Physics" Dhanpat Rai & Sons, Delhi.

Supplementary Resources:

1. <http://nptel.ac.in/courses/115106090/15>
2. <http://nptel.ac.in/courses/115104088/>
3. <http://hyperphysics.phy-astr.gsu.edu/hbase/index.html>
4. <http://vlab.amrita.edu/index.php>