



Semester – I/II

Subject Name: Applied Physics

Subject Code: 09GS1101

Diploma Branches in which this subject is offered: Mechanical Engineering, Electrical Engineering, Civil Engineering, Computer 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 states of matters also to have knowledge of fundamentals of electricity and magnetism.

Credits Earned: 5 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 role of various laws of electricity and use of electrical components and basic circuits.
5. To understand role of magnetism and its 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	
4	0	2	5	50	30	20	25	25	150



Contents:

Unit No.	Unit title and content	Hours	Weightage
1	Units, Dimensions and Measurements	5	20%
	Definition of unit, Fundamental and Derived units, systems of units- CGS, MKS and SI, Dimensional Formula, Uses and limitations of dimensional analysis, introduction to accuracy, precision and errors, types of errors, error analysis		
2	Laws of Motion	10	20%
	Introduction to Motion, Displacement and Distance, Average speed, velocity and acceleration, Inertia, Newton's first law of motion, momentum, Newton's second law of motion, conservation of momentum, Newton's third law of motion		
3	Properties of Matter	10	20%
	Stress, strain, 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, Ideal gas, ideal gas equation, Gas laws		
4	Electricity	10	20%
	Static electricity: electric charge, coulomb's law, electric field, electric flux, capacitance, types of capacitors, capacitors in series and parallel Current electricity: current, EMF and Ohm's law, resistance, series and parallel		
5	Magnetism	10	20%
	Magnetic field, thumb rule, magnetic forces, Biot-Savart Law, electro-magnetic induction-self-inductance and mutual inductance, faraday's law, lenz's law, applications-transformer		

Suggested Theory distribution:

The suggested theory distribution as per Bloom's taxonomy is as per follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery and evaluation					
Remember	Understand	Apply	Analyse	Evaluate	Create
40%	40%	15%	5%	0%	0%



Suggested List of Experiments:

Sr. No.	Name of Topics	Contact Hours
1	Galvanometer (i) To determine resistance of a galvanometer using half deflection method	2
2	Conversion of Galvanometer into Ammeter and Voltmeter (i) To convert a given Galvanometer into Ammeter of a desired range. (ii) To convert a given Galvanometer into Voltmeter of a desired range.	4
3	Vernier Calipers (i) To know the use of the Vernier Calipers. (ii) To measure the length, width and height of the given rectangular block.	4
4	Micrometer Screw gauge (i) To measure the diameter of the small sphere using micrometer screw gauge.	2
5	Newton's second law of motion (i) To find the acceleration of a ball. (ii) To find the distance covered by the ball in the given time interval.	4
6	Resistors and Capacitors (i) To study Resistors in series and parallel. (ii) To study Capacitors in series and parallel.	4

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>