

INSTITUTE	DIPLOMA STUDIES
PROGRAM	DIPLOMA ENGINEERING (CIVIL ENGINEERING)
SEMESTER	1
COURSE TITLE	APPLIED PHYSICS
COURSE CODE	09GS2101
COURSE CREDITS	3

Objective:

- 1 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 matters also to have knowledge of fundamentals of electricity and magnetism and to have knowledge about Light and Sound Waves.

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

- 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

Theory Hours	Tutorial Hours	Practical Hours	ESE	IA	CSE	Viva	Term Work
2	0	2	50	30	20	25	25

Contents : Unit	Topics	Contact Hours
1	Units, Dimensions and Measurements 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	4
2	Laws of Motion 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	4
3	Properties of Matter 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	6

Contents : Unit	Topics	Contact Hours
4	Electro-Magnetism 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	6
5	Waves: Light & Sound 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.	8
Total Hours		28

Suggested List of Experiments:

Contents : Unit	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. 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. 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 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 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 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 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 To calculate refractive index of material of prism using Spectrometer Device	2

Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
8	Demonstrate sound waves creating vibrations and observing their effect Demonstrate sound waves creating vibrations and observing their effect	2
9	To verify Ohm's Law To verify Ohm's Law	2
10	To study Resistors in series To study Resistors in series	2
11	To study Resistors in parallel To study Resistors in parallel	2
12	To verify Faraday's Law To verify Faraday's Law	2
Total Hours		24

Textbook :

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

References:

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

Suggested Theory Distribution:

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

Distribution of Theory for course delivery					
Remember / Knowledge	Understand	Apply	Analyze	Evaluate	Higher order Thinking / Creative
30.00	30.00	40.00			

Instructional Method:

- 1 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.

Instructional Method:

- 2 The internal evaluation will be done on the basis of continuous evaluation of students in the laboratory and class-room.
- 3 Practical examination will be conducted at the end of semester for evaluation of performance of students in laboratory
- 4 Students will use supplementary resources such as online videos, NPTEL videos, e-courses, Virtual Laboratory

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>