

Subject Code: 2SC1050201	Subject Title: Physics
Course Type: Core Course	

COURSE OBJECTIVE:

Physics is a science to understand the nature. This course is designed to get basic understanding of the physical world.

LEARNING OUTCOMES:

- Develop an actual understanding of the Physical systems around us.
- To know the basic concept of Electrostatics and Electronics.
- Understand the Different types of wave and its application in various fields.

Teaching scheme (hours) per week		credit		Theory Examination		Practical Examination		Total
Theory	Practical	Theory	Practical	University Assessment	Cont. Assessment	University Assessment	Cont. Assessment	
4	4	4	2	70	30	30	20	150

A. Physics Theory:

Unit	Content	Lectures	Weight (%)
1	Mechanics of single particle and particles: Motion of Particle subjected to a resistive force (case 1 to 5), Mechanics of a system of particle, motion of a system with variable mass. Motion in a central force field and pendulum: Equivalent one body problem, motion in a central force field, General features of the motion, Motion in a inverse square law force field, Equation of the orbit, Kapler's law of planetary motion. Compound pendulum, bar pendulum.	15	25
2	Electrostatics: Gauss's law, gauss's law in differential form, gauss's law and coulomb's law, force on the surface of a charged conductor, Electrostatic energy in the medium surrounding the charged conductor. Steady Current: Current and current density, Conservation of charge, continuity equation, Ohm's law at a point, Wiedmann and Franz law, The relaxation time, Magnetic field due to steady current: Magnetic of moving point charge, The Bio-Savart law, Application of Bio-Savart law (i) Magnetic field due to steady current in a long strait wire, (ii) Interaction between two parallel long current,	15	25
3	Rectifier and filter circuits: The half wave rectifier, Voltage regulation, Ripple factor, Ratio of rectification, Transformer utilization factor, The full wave rectifier, The bridge rectifier, The inductor filter, The capacitor filter, Ripple factor, The choke input filter, Ripple factor in LC filter, Value of critical inductance, The CLC filter. Transistors: Transistor current components, Detailed transistor leakage currents, C-B Configuration static characteristics, Load line, Operating point.	15	25
4	Waves: Theory of resonator, Dependence of the frequency of resonator on the size and the shape of the mouth, Velocity of transverse waves along a stretched string, Laws of transverse vibration of strings, Melde's experiment, Kundt's tube. Ultrasonic Waves: Ultrasonic, Production of Ultrasonic waves, Piezo-	15	25

	electric oscillator, Magnetostriction oscillator, Detection of ultrasonic waves, Applications of ultrasonic waves		
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Basic Reference book:

1. Introduction to classical mechanics by R.G.Takwale and P.S.Purani.
2. Elements of properties of metal by D.S.Mathur.
3. A text book of Oscillation, Waves and Acoustics by Dr. M. Ghosh and Dr. D. Bhattacharya
4. Electricity and magnetism by K.K.Tiwari, S.Chand & company Ltd.
5. Waves and oscillation by N Subrahmanyam and Brij lal.
6. Hand book of Electronics by Gupta & Kumar

B. Physics Practical:

1. Bar pendulum: Determination of 'K' and 'g'
2. Newton's rings: Determination of R and wave length using sodium light.
3. Melde's Experiment.
4. Determination of self inductance 'L' of inductor.
5. Study of Transformer.
6. P-N Junction diode as Full wave rectifier.
7. Bridge rectifier
8. Basic logic gates- AND.OR.NOT.
9. Verification of maximum power transfer theorem.
10. Double refraction by calcite prism.
11. Find out refractive index of prism using Spectrometer.
12. Study of line Spectra.