

**SARDAR PATEL UNIVERSITY**  
**Programme: B.Sc**  
**Semester: II**  
**Syllabus with effect from: November-2011**

<b>Paper Code: US02CPHY01</b>	<b>Total Credit: 2</b>
<b>Title of Paper: Classical Mechanics &amp; Relativity</b>	

Unit	Description in detail	Weightage (%)
<b>I</b>	<b>Vector Algebra</b> Introduction to scalars and vectors, Surface area as a vector, Scalar triple product, Reciprocal vectors, Vector triple product, Gradient of a scalar point function, Divergence of a vector point function, Curl of a vector point function Irrotational and solenoidal vectors, Gauss Theorem, Greens Theorem, Stokes Theorem.	<b>25%</b>
<b>II</b>	<b>Mechanics of a Particle</b> Introduction to mechanics, Mechanics of a particle, Equation of motion of a particle, Motion under constant force (Atwood.s machine), Motion under force which depends on time only, Motion of a charged particle in electromagnetic field, Motion in a constant electric field, Motion in a constant magnetic field. (Derivation of cyclotron frequency), Motion in a crossed fields (Derivation of drift velocity).	<b>25%</b>
<b>III</b>	<b>Simple Harmonic Motion</b> Acceleration due to gravity, The simple pendulum, Drawbacks of a simple pendulum, Compound pendulum, Interchangeability of centers of suspension and oscillation, Centre of percussion, Other points, collinear with C.G. about which the time period is the same, Conditions for maximum and minimum time periods, Bar pendulum, Kater.s reversible pendulum.	<b>25%</b>
<b>IV</b>	<b>Special Theory of Relativity</b> Frame of reference, Inertial frame of reference, Galilean transformation equation, Luminiferous Ether, Michelson Morley experiment, Einstein's special theory of relativity, Lorentz transformation, Lorentz-Fitzgerald contraction, Time dilation, Mass-Energy equivalence, Energy Momentum relati.	<b>25%</b>

**Basic Text & Reference Books:**

- Introduction to Classical Mechanics - R. G. Takwale & P. S. Puranik Tata McGraw-Hill Publishing Company Ltd., New Delhi
- Elements of properties of matter - D. S. Matur, S. Chand & Co., New Delhi
- Atomic and Nuclear Physics - N. Subrahmanyam and Brijlal Revised by Jivan Seshan, S.Chand & Company Ltd, New Delhi

