

**COURSE – 1 Mathematical Physics and Classical Mechanics**  
**Paper code PHY501**

**Credits - 4**

**BLOCK – 1 : SPECIAL FUNCTIONS**

- UNIT 1 : Legendre's Polynomials
- UNIT 2 : Bessel Functions
- UNIT 3 : Hermite Polynomials
- UNIT 4 : Laplace Equation and Wave Equation

**BLOCK – 2 : INTEGRAL TRANSFORMS**

- UNIT 5 : Fourier Transforms and Application
- UNIT 6 : Laplace Transforms and Applications

**BLOCK – 3 : TENSOR ANALYSIS**

- UNIT 7 : Tensor Algebra
- UNIT 8 : Metric Tensor & Christoffel Symbols

**BLOCK – 4 : MECHANICS OF SYSTEM OF PARTICLES**

- UNIT 9 : Lagrangian Mechanics
- UNIT 10 : Lagrange's Equations
- UNIT 11 : Hamilton's Principle
- UNIT 12 : Hamiltonian Mechanics
- UNIT 13 : Canonical Transformations and Hamilton – Jacobi Theory
- UNIT 14 : Poisson's Brackets

**BLOCK – 5 : NUMERICAL METHODS**

- UNIT 15 : Numerical Interpolation
- UNIT 16 : Numerical Differentiation
- UNIT 17 : Numerical Integration
- UNIT 18 : Solutions Integration
- UNIT 19 : Numerical Solutions of Ordinary Differential Equations