SUBJECT NO-PH41012, SUBJECT NAME- Computational Methods

LTP- 2-0-0,CRD- 2

SYLLABUS :-

Numerical considerations and numerical approach to solving differential equations for physical problems. Numerical solution of linear and nonlinear differential equation in one and higher dimensions. Its application to various physical systems. Shooting methods to solve time-independent Schrodinger wave equation for a particle in a box. Quantum mechanical scattering problems. Time dependent Schrodinger wave equations - direct solution. Solution of heat conduction equation using explicit, implicit and Crank Nicholson methods. Solution of wave equation- method of characteristics, CFL condition, explicit and implicit schemes. Solution of Laplace and Poisson equations, Relaxation methods. Stability of quasi linear system of equations- Fourier method of stability analysis. Spectral methods and finite element methods (elementary introduction). Random walks.