

SARDAR PATEL UNIVERSITY
Programme & Subject: M.Sc (Physics)
Semester: III
Syllabus with Effect from: June - 2014

Paper Code: PS03EPHY06	Total Credit: 4
Title Of Paper: Computational Physics - I	

Unit	Description in detail	Weightage (%)
I	Simple computer programming C: C – Language. Writing a program Input statement. Numerical constants and variables Arithmetic expressions Input and output in C, Conditional statements Loops in program. Defining and manipulation, of arrays. Logical expression and control statements C-program examples Functions.	25%
II	Iterative Solution of Linear equations: Jacobi Iteration method, gauss-Seidal Method, Method of relaxation, Convergence of Iteration methods. Roots of nonlinear Equations: Methods of solutions, Iterative methods, Bisection method, Newton-Raphson Method, Fixed point method.	25%
III	Numerical solution of ordinary differential equations: Taylor series method Eulers method. Fourth order Range – Kutta methods Milne – Simpson method Accuracy of multistep methods Systems of differential equations.	25%
IV	Boundary value and Eigenvalue problems: Finite difference method. Solving eigenvalue problems Polynomial method, Solutions of partial differential Equations: Laplace’s equation, Poisson’s equation Solution of heat equation. Hyperbolic equations	25%

Basic Text & Reference Books:-

- Computer Programming in Fortran 90 and 95 – V. Rajaraman
Prentice-Hall India, 1997
- Computer programming in C – V. Rajaraman
Prentice-Hall of India, 1998
- Object oriented programming with C++-
E. Balaguruswamy
Tata McGraw-Hill Pub. Co., New Delhi, 1999
- Numerical methods – E-Balaguruswamy
Tata McGraw Hill Pub. Co., New Delhi, 1999

