PH305: Computational Physics (2-0-2-6)

Matrices: System of linear equations, Gauss and Gauss-Jordan elimination, Matrix Inversion, LU decomposition, Eigen value and eigenvector problems, Power and Jacobi method, application to physics problems; Ordinary and Partial Differential Equations: Euler, Runge-Kutta and finite difference methods; solution to initial and boundary value problems, Finite difference solutions to hyperbolic, parabolic and elliptic partial differential equations, application to physics problems; Monte Carlo Simulation: Markov process and Markov chain, random numbers, simple and importance sampling, Metropolis algorithm, 2D-Ising model.

Texts:

1. S. S. M. Wong, *Computational Methods in Physics and Engineering*, World Scientific, 1997.
2. T. Pang, *An Introduction to Computational Physics*, Cambridge University Press, 1997.