

DRAFT

Computational Nuclear Engineering Topics

Numerical Methods

1. Gauss Elimination
2. LU Factorization
3. Basic Iterative Solvers (Jacobi and Gauss Seidel)
4. Round-off error and finite precision arithmetic
5. Interpolation (Lagrange polynomials and cubic splines)
6. Basic curve fitting (linear regression)
7. Quadrature techniques (Newton-Coates rules and Gaussian quadrature)
8. Finite Difference Methods
9. Convergence and order of accuracy
10. Time integration techniques (forward and backward Euler, Crank-Nicolson, Runge-Kutta)
11. Stability of numerical methods
12. Eigenvalue problems and solution techniques (power iteration, inverse power iteration)

Monte Carlo Methods

1. Cumulative Distribution Function
2. Probability Density Functions
3. Sampling from a distribution (inverting the CDF and rejection sampling)