Outline of "A beginner's course to Applied Mathematics"

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Lect 1 Introduction

Part I: Basic numerics

Lect 2 Lagrange and Newton interpolation
Lect 3 Spline interpolation
Lect 4 Least squares fitting
Lect 5 Numerical integration: basics
Lect 6 Gaussian quadrature
Lect 7 Adaptive integration and advanced topics
Lect 8 Simple iteration methods for solving linear system
Lect 9 Advanced iteration methods
Lect10 Eigenvalue problems
Lect11 BVP problem for ODE
Lect12 Newton's method for nonlinear system
Lect13 FFT
Lect14 Basic Monte Carlo method
Lect15 Metropolis algorithm
Lect16 Simulated annealing and genetic algorithm
Lect17 Stochastic simulation algorithm (SSA)

Part II: Basic asymptotics

Lect18 Laplace method
Lect19 Stationary phase approximation
Lect20 Saddle point approximation
Lect21 Infinite series summation
Lect22 Miscs