MATH 6205- Computational Finance

MS Math Finance Course

Course description

Jaya Bishwal

Generating Random Numbers and Random Variables: Linear Congruent Generators, Inverse Transform Method, Acceptance-Rejection method, Generating Normal and Multivariate Normal

Generating Sample Path: Brownian motion, Geometric Brownian motion, Options, Short rate models, Square root process

Variance Reduction Method: Control Variate, Antithetic Variate, Stratified Sampling, Latin Hypercube, Importance Sampling

Quasi Monte Carlo: Discrepancy method, Koksma-Hlawka bound, Low discrepancy sequence, Halton sequence

Discretization Method: Euler Scheme, Milstein scheme, Discretization of stochastic volatility models, Jump diffusions

Risk management: Calculating Value at Risk, Variance Reduction using Delta-Gamma, Credit Risk

The text book is: Monte Carlo Methods in Financial Engineering by Glasserman (Springer, 2004) Reference: Simulation Techniques in Financial Risk Managemant by Chan and Wong (Wiley, 2006).

Softwares: MATLAB