Instructor: Dr. Jaya Bishwal
Homepage: http://www.math.uncc.edu/~jpbishwa
Office: Fretwell 345B
E-mail: J.Bishwal@uncc.edu
Phone: 704-687-2566
Class Time: 6:30-9:15 pm

Class Dates and Location: Thurs (Aug 23, Sept 6, 20, Oct 4, 18, Nov 1, 15) at Uptown, Thurs (Aug 30, Sept 13, 27, Oct 11, 25, Nov 8, 29) at Fretwell 319

Office Hours: Thurs 11:00-1:00 pm or by appointment

Homework and Handouts: There will be homework assignments approximately alternate weeks. Homework assignments and other materials will be posted online on my webpage.

Exams and Grading: The grade will consist of homework assignments, one midterm and a final exam. The weights for the final grade are as follows: Homework will be 40%, Midterm will be 30% and final will be 30%. The final will be comprehensive. There is no curve. The following method will be followed. Letter Grade- A: 90%-100%, B: 80%-90%, C: 70%-80%, F: 0%-70%

Exam Dates and Location: Midterm Oct 11 6:30-9:15 pm at Fretwell 319, Final: Mon Dec 10, 6:30-9:15 pm at Fretwell 319

MATLAB Guide by D.J. Higham and N.J. Higham, Software: MATLAB
Contents:

Chapters 1, 2, 3, 4, 5, 6, 7, 9

Course Description:

Foundations

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


Risk Management: Calculating Value at Risk, Variance Reduction using Delta-Gamma Approximation, Credit Risk and Credit Derivatives, Copula Methods