

**FINA 581**

**Quantitative Methods for Finance**

**Fall Semester 2004**

Instructor: Samuel P. Wong

Office: Rm. 4368 (Elevator 17-18)

Tel: 2358-7731

E-mail: [imsam@ust.hk](mailto:imsam@ust.hk)

Grading Scheme: 30% Homework, 30% Midterm and 40% Final

**Course Outline**

This course covers a wide range of statistical techniques which are commonly used in quantitative finance. Revision of Calculus and Matrix Algebra will be provided in the beginning of the course. Elementary probability theory and simulation skills will be introduced as fundamental tools. Elementary Stochastic Calculus and Ito's lemma will be employed in deriving Black-Scholes Model. Various financial applications of linear regression will be discussed. Non-parametric estimation of yield curves will be implemented by regression and smoothing splines. Principal Components Analysis with Value-at-Risk calculations will be studied. We will also explore some statistical properties of linear and non-linear time series models and their maximum likelihood estimation methodology. Non-linear least squares will be used in estimating the interest rates model parameters. Options pricing using artificial neural networks and some other special topics will be covered if time permits.

Textbook: John Hull (2003) Options, Futures, & Other Derivatives (5th Edition) by Prentice Hall.