**MT-451 Continuous-Time Finance**

Introduction to portfolio selection and capital market theory (static analysis): introduction, one-period portfolio selection, spanning, separation, and mutual-fund theorems, on the mathematics and economics assumptions of continuous-time models; continuous-sample-path processes with "no rare events", discontinuous-sample-path processes with "rare events", lifetime portfolio selection under uncertainly (the continuous-time case): dynamics of the model, the budget equation, constant relative risk aversion, infinite time horizon, extension to many assets, constant absolute risk aversion, optimum consumption and portfolio rules in a continuous-time model: a digression on its processes, asset-price dynamics and the budget equation, optimal portfolio and consumption rules, the equations of optimality; log-normality of prices and the continuous-time analog to tobin-markowitz mean-variance analysis, noncapital gains income, wages. Poisson processes, alternative price expectations to the geometric brownian motion, conclusion, further developments in the theory of optimal consumption and portfolio selection: the cox-huang alternative to stochastic dynamic programming, optimal portfolio rules when the non-negativity constraint on consumption is binding, generalized preferences and their impact on optimal portfolio demands.

**Recommended Books:**


1. "Continuous Time Finance", Robert C. Merton, Blackwell Publishing Ltd, Reprinted 2003.
2. "Finance in Continuous Time", David Shimko, Wiley Blackwell, 1995.
3. "Three Essays On Continuous Time Finance", Hua Tang, Colombia University, 2001.