The course is designed to provide students with a mathematical background to study modern financial theory. This approach has become extremely important for financial analysts or “QUANT.” We will study in a systematic way to price (evaluate) and hedge (eliminate) risks associated with the uncertainties of asset prices such as stocks, interest rates, credits, energy, loans, insurance, etc.

Instructor: Chuan-Hsiang Han (韓傳祥)
Department of Quantitative Finance, NTHU
Office: 204-2 Innovation Incubator (育成中心)
Phone: 03-5742224
Email: chhan@mx.nthu.edu.tw
URL: enter from http://mx.nthu.edu.tw/~chhan

Class Time: T7T8T9
Office Hours: 1000 – 1300 Wednesday or by appointment
Location: Room 102, R&D Bldg (研發102)

Prerequisites:
STAT 3875 (basic knowledge of probability and statistics.)
MATH 2030 Advanced Calculus
QF 3146 Financial Mathematics

Textbooks:

References:
Course Contents:
1. Elementary probability and stochastic processes (convergence of integrals; change of measure; conditional expectation.)
2. Brownian motion (random walk; discrete-time models in finance; martingale property; variations; Markov property.)
3. The Black-Scholes model (stochastic calculus; Ito’s lemma; market completeness; pricing partial differential equation; hedging strategy; Brownian bridge.)
4. Risk-Neutral pricing (Girsanov’s theorem; martingale representation theorem; fundamental theorems of asset pricing.)
5. Conditional Expectation and PDEs (Feynman-Kac Formula)
6. Simulation and algorithms for financial models.

Grading:
Assignments 30%, Exams(midterm and final) 50%, Course Project 20%.