Spring 2013 **Derivatives Pricing 衍生性商品訂價** QF 314102

Designed for students with scientific background, this course aims to give a broad overview of modern financial theory and derivative markets. No financial or economic knowledge is required. This course consists of three parts: (1) option pricing theory and the derivative markets, (2) risk management, and (3) credit risk and systemic risk.

This course is project based. No in-class written exams, but a group project is required when each part of the course subject is finished.

We start from introducing Brownian motions, stochastic calculus, and their applications to Black-Scholes-Merton's theory. Then markets and models of several risk factors related to equity, interest rate, credit, volatility, etc, are introduced as well as some basic statistical estimations and computational methods. We also discuss risk measures and the management of risks by trading derivative contracts.

Instructor: Dr. Chuan-Hsiang Han (韓傳祥). Department of Quantitative Finance, NTHU

Office: Room 756 TSMC BLD(台積館)
Office Hours: 10 - 12 Wednesday, 10 - 12 Friday, or by appointment
Phone: 03-5742224
Email: chhan@mx.nthu.edu.tw
URL: mx.nthu.edu.tw/~chhan

Class Hours: W 7-9
Classroom: Room 206, TSMC BLD(台積館)

Prerequisite:

equivalent to STAT 387500 (basic knowledge of probability and statistics.)

Textbooks:

(1) John Hull, "Options, Futures, and Other Derivatives," Prentice Hall, (8th edition) 2011.
(2) 韓傳祥, "金融隨機計算," 新陸書局, 2012.

References:

(1) R. K. Sundaram and S. R. Das, “Derivatives: principles and practice,” McGraw-Hill/Irwin. (1st edition) 2010.

(2) Alison Etheridge, “A Course in Financial Calculus,” Cambridge University Press, (1st edition) 2002.

Grading:

Assignments 30%, Exams(project based) 30%, Biweekly Report 20%, Course Project 20%.

Course Contents:

1. Review Binomial Tree Models with Pricing Derivatives
2. Basic Stochastic Calculus in Finance
3. The Black-Scholes-Merton Pricing Theory
4. The Greek Letters
5. Option markets
6. Volatility Smiles, VIX Derivation
7. Basic Numerical Procedures
8. (Conditional) Value at Risk and backtesting
9. Estimating Volatilities and Correlations
10. Credit Risk
11. Credit Derivatives
12. Exotic Options
13. Systemic Risk

Useful Links:

IAFE http://iafe.org/html/

CBOE http://www.cboe.com/

CBOE TV http://www.cboe.com/tradtool/webcast.aspx

VIX’s View http://www.spvixviews.com/

Yahoo Finance http://finance.yahoo.com/

Wilmott http://www.wilmott.com/

中央銀行 http://www.cbc.gov.tw/mp1.html
期交所 http://www.taifex.com.tw/chinese/home.asp
證交所 http://www.twse.com.tw/ch/index.php