

Course Title: 進階衍生性商品訂價與應用 (Advanced derivatives pricing and applications)

Lecture Hours: W2W3W4

Classroom: Room 206, TSMC BLG

Instructor: Dr. Chuan-Hsiang Han

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Office Hours: TBD.

Syllabus:

Advanced stochastic financial models for foreign exchange, interest rate, credit risk, and real options are introduced. We further introduce the use of machine learning techniques to solve for investment problems. These new techniques include artificial neural network, support vector machine, and so on. The use of derivatives for hedging portfolios generated from machine learning will be implemented.

Contents:

- Advanced Stochastic Financial Models:
  - Foreign exchange
  - Interest rate
  - Credit risk
  - Real Option
- Machine Learning
  - regression
  - kernel smoothing
  - support vector machine
  - artificial neural network

References:

- J. Hull. Options, Futures, and other Derivatives. Ninth Edition. 2014.
- D. Brigo, F. Mercurio. Interest Rate Models - Theory and Practice: With Smile, Inflation and Credit. Springer Finance; 2nd edition (August 2, 2006)
- 韓傳祥. 金融隨機計算. 新路書局. 2012.
- T. Hastie, R. Tibshirani, J. Friedman. The Elements of Statistical Learning: Data Mining, Inference, and Prediction. Second Edition. Springer. 2009.
- Lecture Notes provided.

Grading Policies: Homework (20%), Exams (40 %), Final Project (40%)