Course Title: Economics 377, Financial Derivative Markets Fall 2018
Classroom: Social Sciences 327
Times: Tuesdays & Thursdays, 3:05–4:20PM
Professor: Ronald Leven
Office Location: Social Sciences 329F
Office Hours: Wednesday 2:00–4:00PM (subject to change) or by appointment

Overview: The course covers markets in standard financial derivatives – e.g., forwards, futures, swaps and options - with intent to establish the theoretical basis of prices as well as the practical use – and pitfalls – of these products. Time permitting, more advanced topics will be covered including, exotic options and financial engineering.

Topical articles will be added as the semester progresses

Prerequisites: Introductory economics; either a statistics/probability course, or knowledge of basic probability concepts such as mean, variance, and covariance; a 100-level finance class and basic calculus are helpful but not required.

Grades: There will be a mid-term on October 11th (20%) and a final on December 15th (30%). Students will also be expected to complete weekly assignments (20%) and a term paper on the design of a new derivative contract (25%). Classroom participation is encouraged (5%).

COURSE OUTLINE
For the chapter readings, “M” denotes the McDonald text and “L” the Lo text.

I Basics of derivatives

1) Introduction to derivative markets (M Ch. 1; L Ch. 1.3)
   Vocabulary of the market
   Trading of financial assets and some discussion of commodities
   Stock, bond, currency markets
   Basic aspects of derivatives and defining basis risk
   Buying and shorting financial assets

2) Discounting and the time value of money (M Appendix B, Ch. 7.1-7.3, 7.5, 7.A)
   Annual discounting
   Periodic compounding
   Continuous compounding
   Changing interest rates
   Pure discount vs coupon paying bonds
   Present Value (PV) and Future Value (FV)
   Leverage
3) Forward and Futures Markets (M Ch. 2.1, 5-6, 7.4; L Ch. 1.1, 2)
   How time value is reflected in forward markets
   Cross-market interest rates and currency forwards
   Settlement issues for Forward Markets
   How futures markets differ from forwards
   Futures on indices

4) Plain Vanilla Options and Basic Strategies (M Ch. 2.2-2.6, 3; L Ch. 1.2, 3)
   Payoffs and profits from options, futures, and forwards
   Insurance strategies
   Spreads, straddles, and related strategies
   Simple hedging
   Put-Call parity
   Style and maturity

II Asset pricing and applications to derivatives

5) Black-Scholes valuation (M Ch. 12-13; L Ch. 5-6, 7.1)
   Basic formula
   Volatility, historical and implied
   The Greeks
   Dynamic delta hedging and extended hedging
   Volatility “smirks” and “smiles”
   The VIX ‘fear gauge’

6) Interest rate swaps and related topics (M Ch. 7, 8)
   The yield curve and discounting
   Valuation of the two sides
   The swap rate and the swap rate term structure
   An introduction to swaptions

7) Credit derivatives (M Ch. 27)
   The probability model
   Synthetic swaps, correlation, and potentials for mis-pricing
   Sovereign default swaps

8) Trading Volatility (M Ch. 24)

III Other Items as time permits.

9) Exotic derivatives (M Ch.10-11, 14; L Ch.4, 8)

10) Financial Engineering, Uses and Abuses of Derivatives (M 15-16)