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.

Texts: DERIVATIVE MARKETS, Third Edition, R.L. McDonald, Pearson (2013).
DERIVATIVE PRICING – A Problems Based Primer, Ambrose Lo, CRC Group (2018).
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)