

Financial Derivatives
FNCE 206/717
Summer 2019
As of: June 30, 2019

Time: MW 4:30-8:20pm

Location: JMHH F60

Instructor: Ronel Elul

Email: elul@wharton.upenn.edu

Office Hours: Tues 915-10am in SHDH 2452, and most days after class

Telephone: 215-574-3965

URL: <http://canvas.upenn.edu> and <http://finance.wharton.upenn.edu/~elul/deriv>

Course Description: This course is an introduction to the world of derivative securities, and in particular explores the interaction between an elegant mathematical theory and real-world application. Although the theory may appear fairly mathematical and abstract, it has proved to be one of the success stories of modern economics, providing surprisingly accurate predictions. We will develop a clear understanding of, and appreciation for, this theory, while at the same time demonstrating how it is applied in practice. Applications will be through cases, and we will also briefly discuss how to use Bloomberg Machines to value derivatives.

Prerequisites: A first course in Finance (e.g. FNCE 100/611). Probability and Statistics (**essential**). A good background in Calculus (**essential**).

Readings: The main text for the course is Options, Futures and Other Derivatives, by Hull (10th edition); this is the book favored by Wall Street practitioners. You should purchase this book, which comes together with the solutions manual. There will two bulk packs available on study.net (link through Canvas). One has the class slides (you should make sure to get this one before the first day of class) and the other has cases and readings.

Grading: Grading will be based on cases (30%), an in-class midterm on **Monday July 22** (25%), and an in-class cumulative final on **Wednesday August 7** (45%).

Derivatives –Topic List

Case due dates are preliminary and subject to change. *Please check Canvas for updates.*
References are to *Options, Futures and Other Derivatives* by J. Hull (10th ed)

7/8 (class ends at 730pm today): Session 1: Introduction, Financial Innovation (Ch 1, Miller reading). Case groups.

Session 2: Futures & Options – Introduction (Ch2 except 2.10, 3.1-3.3, 3.5, Ch 10 except 10.10)

Session 3: Interest Rates – Review (4.1-4.7, skim 4.8-4.9). Valuing Futures and Forwards. (Ch 5 except 5.14)

7/10: Session 4: Swaps (7.1, 7.5-7.7, 7-10-7.11, skim 7.2-7.4, 7.8, 7.12; additional notes on IRS valuation will be provided)

Session 5: Qualitative Properties of Option Prices (Ch 11)

Session 6: Option Strategies (Ch 12)

Southwest Case Due

7/15: Session 7: Binomial Option Pricing (Ch 13, skim 21.1-21.4);

Session 8: Continued

Session 9: Foundations of Binomial Option Pricing. (Fed Fund Futures Articles)

7/17: Session 10: Introduction to Brownian Motion and Stochastic Calculus (14.1-14.4).

Session 11: Midterm Review

PEPS Case Due

7/22: Midterm Exam (in class, covers through Session 9)

Session 12: Brownian Motion, Continued (14.6-14.7, 15.1-15.4)

Session 13: The Black-Scholes Model (15.5-15.6, 15.8-15.9, 15.11)

7/24: Session 14: Extensions to Black-Scholes (15.12, 17.1-17.4, 18.1-18.3, 18.7, skim 18.8);

Hedging with Black-Scholes (19.1-19.7, 19/12; skim 19.8-19.10)

Session 15: Risk Neutral Valuation and Black-Scholes (15.7);

Monte Carlo Valuation (21.6); Volatility Smiles (20.1-20.4, optional: Simons model risk article)

Monte Carlo Simulation Due

7/29: Session 16: Value at Risk (22.1-22.4, 22.6-22.8, Simons VaR article, Taleb book optional);

Session 17: Duration (4.10)

Wells Fargo Case Due

7/31: Session 18: Credit Risk in Corporate Debt. Credit Derivatives (24.1-24.6, 25.1-25.3, skim 25.8-25.9)

Session 19: Stress Testing (not on exam). Material to be distributed

8/5: Conclusion and Review. *Orange County Case Due at Start of Class*

8/7: Final Exam (in-class at 430pm, comprehensive - through session 18)