Finance 512 – Financial Derivatives—Course Outline

This syllabus describes the topics to be covered during the term. Some material may be altered or expanded as the semester goes along. For general information about the class, see the handout course_info.pdf on the course Compass pages.

The lecture notes are the only text for the course. (They will be distributed each class and posted to the Compass site.) There is a packet of cases at the bookstore, which you should purchase. You may also want to purchase one of the following recent text books to serve as a reference:


The syllabus below shows the sections of the text books which relate to the material covered in that lecture. This reading is not required. Also not required, but very fun reading on real world episodes where derivatives usage and models affected the whole economy:


An additional reference for more background on the markets and the role of financial engineering is:


Note the dates for the case discussions, which is when assignments are due. See course_info.pdf for details on these.

Schedule of classes:

1. **Tuesday, January 21.** Introduction  
   Readings: course information handout

   **Part I: Forwards and Futures Markets**

2. **Thursday, January 23.** Forwards and Futures Contracts  
   Readings: Hull Ch. 5; McDonald Chs. 5,6,7.

3. **Tuesday, January 28.** Futures vs Forwards  
   Case: Russian Rouble: June 1998 (Compass)
PART II : Swaps Markets

   Readings:
   Hull Chs. 7, 32; McDonald Ch. 8; Whaley Ch. 4.

5. Tuesday, February 4. Swaps: Evolving Infrastructure
   Cases:
   SEFs (Compass)

6. Thursday, February 6. Interest Rate Swaps, Return Swaps

7. Tuesday, February 11. Applications
   Case:
   Swap Spreads (Compass) or Grosvenor Group (packet)

PART III : Options Markets

8. Thursday, February 13. Options: Static Arbitrage Relations

9. Tuesday, February 18. Financing Arbitrage Positions
   Case:
   Quadriserve (packet) or Citigroup Preferred (packet)

10. Thursday, February 20. Curvature Restrictions and State-Price Densities

11. Tuesday, February 25. Dynamic Arbitrage and Stochastic Assumptions
    Readings:
    Hull Chs. 11, 19.1-19.3; McDonald Chs. 10, 11
    Case:
    S&P 500 futures options (packet)

12. Thursday, February 27. Continuous Time Arbitrage
    Readings:
    Hull Chs. 12, 13, 17; McDonald Chs. 12, 13.5, 18, 20; Whaley Ch. 7.

13. Tuesday, March 4. Applying the Theory
    Case:
    TARP Warrants (packet)

14. Thursday, March 6. Extending the Black-Scholes-Merton Results
    Readings:
    Hull Ch. 15, 24.11; McDonald Chs. 12.2, 14.6, 22.6

15. Tuesday, March 11. Application of Generalized Formulas
    Case:
    Arley Merchandise (packet)

    Readings:
    Hull Chs. 18, 26.2; McDonald Ch. 23.

17. Tuesday, March 18. Options Valuation with Stochastic Volatility

18. Thursday, March 20. Midterm Exam
Part IV : Derivatives on Non-Traded Underlyings

19. Tuesday, April 1. Derivative Pricing with Multiple Sources of Risk
   Readings: McDonald Chs. 19, 21; Hull Chs. 27.

20. Thursday, April 3. Arbitrage in N Dimensions: Applications

21. Tuesday, April 8. Volatility Derivatives
   Case: VXX ETF (Compass)

Part V : Credit Markets

22. Thursday, April 10. Structural Models of Credit Risk
   Readings: McDonald Chs. 15.1-15.3, 16.1, 27.1-27.3; Whaley Ch 12.

23. Tuesday, April 15. Application of Structural Models
   Case: Apple bonds 2013 (Compass).

24. Thursday, April 17. Single Name Credit Derivatives
   Readings: Hull Chs. 23.1, 23.2; McDonald Ch. 27.4, Whaley Ch 19.

Part VI : Asset-Backed Products

25. Tuesday, April 22. Multi-name Credit Derivatives: Introduction
   Case: Delphi (packet)

26. Thursday, April 24. Multi-name Credit Derivatives: CDOs
   Readings: Hull Ch. 23; McDonald Ch. 27.4.

27. Tuesday, April 29. Mortgage-backed Securities
   Readings: Hull Ch. 31.3
   Case: The London Whale. (Compass)

28. Thursday, May 1. Financial Engineering and the Subprime Crisis

29. Tuesday, May 6. Course review

30. Week of May 8-14 Final exam