Course Description

The objective of this course is to undertake a rigorous study of the theoretical foundations of modern financial economics. The course will cover the central themes of modern finance including individual investment decisions under uncertainty, stochastic dominance, mean-variance theory, capital market equilibrium and asset valuation, arbitrage pricing theory, option pricing and the potential application of these themes. Upon completion of this course, students should acquire a clear understanding of the major theoretical results concerning individuals’ consumption and portfolio decisions under uncertainty and their implications for the valuations of securities.

Prerequisites

The prerequisites for this course are graduate level microeconomics (Economics 681 or Economics 701), matrix algebra, and calculus. The microeconomics courses may be taken concurrently.

Course Material

The required textbook for this course is:


A recommended complementary text is:

Other excellent texts that cover related material are:


For background reading, the following textbooks may be useful:


**Course Work and Grading**

Homework assignments will be handed out every Tuesday (starting on Sept. 21) and will be due in class the following Tuesday. While you may work on the homework in groups, you must hand in your own answers. Homework assignments will be graded on a three point scale.

There will be a closed-book final during the final exam period. Students are expected to come to class and to actively participate in class discussion. Final grades will be determined by 20% homework and 80% final exam. Class participation will count for students on the margin between grades.
Course Outline and Readings

Note: Dates are approximate

1. Decision Making under Uncertainty (Sept. 9, 14, 21)

   - Outline
     - Expected utility representations
     - Risk aversion
     - Insurance premium; certainty equivalent wealth
     - A simple portfolio choice problem and its comparative statics
     - Some important utility functions
     - Global risk aversion
   
   - Readings:
     (a) HL Chapter 1
     (b) LW Chapters 8, 9, 11, 12.1–12.3

2. Stochastic Dominance (Sept. 23, 28)

   - Outline
     - Motivation
     - First order stochastic dominance
     - Second order stochastic dominance
     - A definition of risk; mean-preserving spreads
   
   - Readings
     (a) HL Chapters 2.1–2.10
     (b) LW Chapters 10, 12.4, 12.5
3. Mean-Variance Portfolio Analysis (Sept. 30, Oct. 5)

- Outline
  - Motivation
  - Notation and definitions
  - Characterization of minimum variance portfolios
  - Properties of minimum variance portfolios
  - The case with a riskless asset

- Readings
  (a) HL Chapter 3

4. Portfolio Separation and the Capital Asset Pricing Model (CAPM) (Oct. 12, 14)

- Outline
  - First derivation of the CAPM
  - One and two-fund separation
  - Second derivation of the CAPM

- Readings
  (a) HL Chapters 4.1–4.17
5. **Arbitrage Pricing Theory** (Oct. 19, 21)

- **Outline**
  - The linear factor model
  - An economy with 1 factor and no residual risk
  - An economy with \( k \) factors and no residual risk
  - An economy with \( k \) factors and residual risk
- **Readings**
  (a) HL Chapters 4.18–4.22
  (b) LW Chapters 20.1–20.5

6. **State-Contingent Claims** (Oct. 28, Nov 2)

- **Outline**
  - Pareto-optimal allocations
  - Complete markets economy and competitive equilibrium
  - Security markets economy
  - Using options to complete markets
  - Representative agent
  - Aggregation
- **Readings**
  (a) HL Chapter 5
  (b) LW Chapters 1, 14, 15
7. State Prices and Arbitrage (Nov 4, 9)

- Outline
  - Definitions of arbitrage
  - Fundamental theorem of asset pricing
  - Link to equilibrium pricing
  - Application to options

- Readings
  (a) HL Chapters 6.1-6.9
  (b) LW Chapters 2, 3, 5, 6, 18

8. Multi-Period Security Markets (Nov. 11, 16)

- Outline
  - Information structure
  - Pareto optimal allocations and rational expectations equilibria
  - Complete markets competitive equilibrium
  - Security market equilibrium and dynamic completeness

- Readings
  (a) HL Chapters 7.1–7.8, 7.11-7.15
  (b) LW Chapters 21, 23

- Outline
  - Dynamic programming
  - Characterization of optimal consumption and investment policies
  - Representative agent revisited
  - Consumption CAPM
  - Extensions to non-expected utility

- Readings
  (a) HL Chapters 7.9, 7.10, 7.16, 7.19, 7.20, 7.22

- **Outline**
  - Definition of a martingale
  - Martingale property of prices and no-arbitrage
  - The martingale representation technology
  - Characterization of optimal consumption and investment policies
  - Asset pricing
  - The binomial model
  - Term structure models

- **Readings**
  (a) HL Chapter 8
  (b) LW Chapters 22–26