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 photocopy of a draft of this book will be available from Wharton Reprographics. For each section, the readings from this text are listed first. Optional readings from the text are in parentheses.

Listed papers will be available as a course pack from Wharton Reprographics. Later in the semester, previous exams and solutions will also be available as a course pack.
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 on Thursdays starting the second week of classes and will be due in class the following Thursday. 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. The date and time, as determined by the Registrar, is December 21, 9:00–11:00 AM.

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.

**Teaching Assistant**

The teaching assistant for this course will be Dieter Vanwalleghem. He can be reached by email at dieter@wharton.upenn.edu.
Course Outline and Readings

Note: Dates are approximate.


   • Outline
     – Expected utility representations
     – Risk aversion
     – Insurance premium; certainty equivalent wealth
     – Portfolio choice
     – Important utility functions
     – Global risk aversion

   • Readings:
     (a) Chapters 1.1–1.7, 2.1–2.3

2. Stochastic Dominance Sept. 22.

   • Outline
     – Motivation
     – First order stochastic dominance
     – Second order stochastic dominance
     – A definition of risk; mean-preserving spreads

   • Readings
     (a) Chapter 1.8
3. **Mean-Variance Portfolio Analysis** Sept. 24, 29, Oct. 1.

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

- **Readings**
  (a) Chapters 2.4–2.6, 5.1–5.6, (5.7–5.11)

4. **Portfolio Separation and the Capital Asset Pricing Model (CAPM)** Oct. 6, 8, 13.

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

- **Readings**
  (a) Chapters 6.1–6.4, (6.5–6.6)

- Outline
  - The linear factor model
  - The case of no residual risk
  - The case with residual risk

- Readings
  (a) Chapter 6.7


- Outline
  - Pareto-optimal allocations
  - Complete markets economy and competitive equilibrium
  - Security markets economy
  - Using options to complete markets
  - Representative agent
  - Aggregation

- Readings
  (a) Chapters 2.7–2.9, 3, 7.1–7.3, (7.4), 18.1–18.2
7. **State Prices and Arbitrage** Oct. 29.

- **Outline**
  - Definitions
  - Fundamental theorem of asset pricing
  - Complete markets
  - Application to options

- **Readings**
  (a) Chapters 4.1–4.2, (4.3–4.8), 15.1–15.2


- **Outline**
  - Description of the economy
  - Pareto optimal allocations
  - Complete markets competitive equilibrium
  - Dynamic completeness
  - Security market equilibrium

- **Readings**
  (a) Chapter 8 (skim)

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

- **Readings**
  (a) Chapters 9, 11.1–11.5, (11.6, 11.7)

- **Outline**
  - Notation and definitions
  - Martingale property of prices and no-arbitrage
  - Market completeness
  - Individual optimization
  - Binomial model
  - Dynamic term structure models

- **Readings**
  (a) Chapter 8 (read thoroughly)