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 website for this course can be accessed through Canvas:
  
  https://canvas.upenn.edu.

  Lecture notes, problem sets, announcements, and readings will be posted here.

- The textbook for the course is:
  

  On the syllabus, readings from the textbook are prefaced by HL. This textbook is out of print. Copies of the relevant chapters can be accessed through the course website.

- Following each topic, there is a list of recommended articles. These can also be accessed through the website.
Other reading

Some excellent texts that cover material related to this course are:


For background reading, the following textbooks may be useful:


Course Work and Grading

Homework assignments will be available on Canvas and will be due on Friday in class starting September 11. 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 is a midterm and a final exam. The midterm will be held in class on October 23. The final will be held on the date determined by the Registrar, which is Thursday, December 17, from 12 to 2. Final grades will be determined as follows: Homework (20%), midterm (35%) and final (45%). In addition, students are expected to come to class and to actively participate in class discussion. Class participation will count for students on the margin between grades.

Teaching Assistant

The teaching assistant for this course is Mete Kilic. He can be reached by email at mkilic@wharton.upenn.edu. His office hours are Thursdays from 4:30 to 5:30 in SH-DH 2406.
Course Outline and Readings

Note: Dates are approximate.

I Decision Making under Uncertainty Aug., 28, Sept. 4

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

• Readings:
  (a) HL Chapter 1
  (c) Pratt, J., 1964, Risk aversion in the small and in the large, Econometrica 32, 122-136.
  (d) Ross, S., 1981, Some stronger measures of risk aversion in the small and large with applications, Econometrica 49, 621-638.

II Stochastic Dominance Sept. 4

• 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
III Mean-Variance Portfolio Analysis Sept. 4, Sept. 11

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

- Readings
  (a) Chapter 3

IV Portfolio Separation and the Capital Asset Pricing Model (CAPM) Sept. 18

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

- Readings
  (a) HL Chapters 4.1–4.17
V Arbitrage Pricing Theory Oct. 2

- Outline
  - Linear factor model
  - An economy with one factor and no residual risk
  - An economy with multiple factors and no residual risk
  - An economy with multiple factors and residual risk

- Readings
  (a) HL Chapters 4.18–4.22

VI State-Contingent Claims Oct. 2, Oct. 16

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

- Readings
  (a) HL Chapter 5
VII State Prices and Arbitrage Oct. 30.

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

- Readings
  (a) HL Chapters 6.1–6.9

VIII Multi-Period Securities Markets Nov. 6

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

- Readings
  (a) HL Chapters 7.1–7.8, 7.11-7.15
IX Characterizing Optimal Consumption and Investment Policies: Dynamic Programming Nov. 13, Nov. 20

• Outline
  – Dynamic programming
  – Characterization of optimal consumption and investment policies
  – Representative agent revisited
  – Consumption CAPM

• Readings
(a) HL Chapters 7.9, 7.10, 7.16, 7.19, 7.20, 7.22
X Optimal Consumption/Investment Policies and Asset Pricing: The Martingale Representation Approach Nov. 25\textsuperscript{1}, Dec. 4

- Outline
  - Notation and definitions
  - Martingale property of prices and no-arbitrage
  - Market completeness
  - Individual optimization
  - Asset pricing: Binomial model

- Readings
  (a) HL Chapter 8

\textsuperscript{1}This class is on the Wednesday before Thanksgiving. It will take place at the same time and place as the regular class.