Outline: The topics to be covered are:

1. Basic Concepts:
   a) Absolute Risk Aversion
   b) Relative Risk Aversion
   c) Certainty Equivalence
2. Portfolio Analysis
3. The Capital Asset Pricing Model (CAPM)
4. Static Equilibrium Asset Pricing:
   a) The Stock-Market Economy
   b) Arrow-Debreu Securities
   c) State Prices
   d) Risk-Neutral Pricing
   e) Consumption-Based Capital-Asset Pricing (CCAPM)
5. Dynamic Equilibrium Asset Pricing:
   a) The Multiperiod Model
   b) Dynamic Completeness
   c) Risk-Neutral Pricing(d) Stochastic Discount Factor
6. Static Arbitrage Pricing:
   a) Using Options to Increase the Asset Span
   b) Butterfly Spreads
   c) Arbitrage
   d) The Law of One Price
7. Dynamic Arbitrage Pricing:
   a) The Binomial Model
   b) Arbitrage
   c) European Call Options
8. Stochastic Calculus:
   a) Wiener Process
   b) The Wiener Process as a Limit of Random Walks
c) Stochastic Differential Equations
d) Itô’s Lemma
e) Geometric Wiener Process
f) Expected Discounted Values and Partial Differential Equations

9. The Black-Scholes Model:
   a) The Black-Scholes Equation
   b) Forward Contracts
c) European Call Options
d) European Put Options
e) The Greeks

10. Exotic Options:
    a) American Options
    b) Barrier Options
c) Lookback Options
d) Asian Options

11. Term Structure and Interest Rates:
    a) Models of Bond Prices
    b) One-Factor Equilibrium Models
c) Models of the Affine Class
d) Vasicek Model
e) Cox-Ingersoll-Ross Model
f) Heath-Jarrow-Morton Model

**Background Reading:**

For those with less of a financial background, the early chapters of

- Hull, J.C.: “Options, Futures and Other Derivatives”, any recent edition (e.g. 7th, 8th or 9th) may be helpful. For those with less of a mathematical background, the early chapters of

- Björk, Tomas (2009): “Arbitrage Theory in Continuous Time”, any recent edition (e.g. 2nd or 3rd) would be useful preparation for the main course.

**Main Textbooks for the Course:**

The main textbooks for the course will be:

Björk, Tomas (2009): “Arbitrage Theory in Continuous Time”, 3rd edition, Oxford University Press. For the applications, we will focus mainly on Chapters 7 (Arbitrage Pricing), 9 (Parity Relations and Delta Hedging), 16 (Dividends), 18 (Barrier Options), 22 (Bonds and Interest Rates), 23 (Short-Rate Models), 24 (Martingale Models for the Short Rate), 25 (Forward Rates). However, many students will want to refer back to some of the preceding chapters as the need arises.