

SIMON FRASER UNIVERSITY  
Department of Economics

Econ 815 – FINANCIAL ECONOMICS I  
Syllabus – Fall 2017

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## COURSE OBJECTIVES AND PREREQUISITES

This course is the first of a two course sequence in financial economics. The goal is to survey a variety of topics in asset pricing theory. The follow-up course by Bertille Antoine (Econ 818), will then focus on empirical issues. Financial economics provides a great example of the interaction between theory and empirical evidence. The goal of this two-course sequence is to illustrate this.

We are going to discuss 9 key ideas in asset pricing theory; roughly one per week. Students will be asked to read the following 9 papers: (1) Arrow's (1964) model of dynamic spanning, (2) Sharpe's (1964) CAPM model, (3) Merton's (1969) dynamic partial equilibrium model of optimal consumption/portfolio decisions, (4) Black & Scholes' (1973) option pricing model, (5) Lucas's (1978) general equilibrium consumption-based CAPM model, (6) Harrison & Kreps' (1978) model of speculative trading with heterogeneous beliefs, (7) Harrison & Kreps' (1979) theory of risk-neutral pricing and equivalent martingale measures, (8) Grossman & Stiglitz' (1980) informational efficiency impossibility theorem, and (9) Tirole's (1982) No Trade theorem. Although these papers may appear to be a bit 'dated', they continue to exert a profound influence on modern financial theory and practice. If time permits, we will discuss some of these recent extensions.

Much of modern financial theory uses the tools of continuous-time stochastic processes and continuous-time dynamic optimization. The first couple weeks of the course will provide a 'crash course' tutorial on these methods.

## COURSE EVALUATION

	<u>Weight in Grade</u>
Problem Sets	– 20%
Midterm exam ( <b>Thursday, October 19</b> )	– 40%
Final exam ( <b>To Be Decided</b> )	– 40%

## COURSE MATERIALS

There is no required textbook for this course. Papers and notes will be posted on the website as we go along. For those seeking a good textbook treatment of modern asset pricing, I recommend John Cochrane's (2005) book, *Asset Pricing*, which is available at the bookstore and on reserve at the library.

## COURSE OUTLINE AND READINGS

### I. MATHEMATICAL BACKGROUND

- Sept. 14 – **Introduction and Overview**  
Cochrane text, Preface  
Shiller, “Nobel Prize Lecture: Speculative Asset Prices” (class webpage)
- Sept. 14 – **Stochastic Processes**  
Dixit & Pindyck, Chpt. 3 (pgs. 59-71)  
Key Terms & Concepts: *Sample Paths, Stationarity, Martingales, Binomial Tree, Filtration, Weak Convergence, Mean-Squared Convergence, Ito Integral, Wiener Process, Brownian Motion, Diffusion Process*
- Sept. 21 – **Stochastic Calculus**  
Dixit & Pindyck, Chpt. 3 (pgs. 79-81)  
Cochrane (2013), “Continuous Time Summary/Review” (webpage)  
Key Terms & Concepts: *Ito’s Lemma, Stochastic Differential Equations, generator, Feynman-Kac Formula*
- Sept. 21 – **Dynamic Programming**  
Dixit & Pindyck, Chpt. 4 (pgs. 93-107)  
Key Terms & Concepts: *Value Function, Hamilton-Jacobi-Bellman (HJB) Equation*

### II. ASSET PRICING THEORY

- Sept. 28 – **Financial Markets and Arrow-Debreu General Equilibrium**  
Arrow (1964), “The Role of Securities in the Optimal Allocation of Risk-Bearing”  
Athreya (2013, pgs. 208-13), “Time, Uncertainty, and the ADM Model”  
Key Terms & Concepts: *Complete Markets, Contingent Claims, Arrow Securities*
- Sept. 28 – **Dynamic Spanning**  
Radner (1972), “Existence of Equilibrium of Plans, Prices, and Price Expectations”  
Athreya (2013, pgs. 214-21), “The Radner Version of the ADM Economy”  
Key Terms & Concepts: *Radner Equilibrium*
- Oct. 5 – **Portfolio Theory**  
Campbell (2003), “Lecture Notes” (pgs. 1-11)  
Campbell (2000), “Diversification: A Bigger Free Lunch”  
Key Terms & Concepts: *Diversification, Mean-Variance Efficiency, Systematic Risk*
- Oct. 5 – **The CAPM**  
Sharpe (1964), “Capital Asset Prices: A Theory of Mkt. Equil. under Conditions of Risk”  
Luenberger (1998), “The Capital Asset Pricing Model”  
Campbell (2003), “Lecture Notes” (pgs. 12-22)  
Cochrane (1999), “Portfolio Advice for a Multifactor World”  
Key Terms & Concepts: *The Market Portfolio, Beta, Sharpe Ratio, Capital Market Line*

- Oct. 12 – **Dynamic Consumption/Portfolio Rules**  
Merton (1969), “Lifetime Portfolio Selection Under Uncertainty: The Continuous-Time Case”  
Key Terms & Concepts: *CRRA vs. CARA Utility*
- Oct. 12 – **Applications and Extensions of the Merton Model**  
Class Notes  
Key Terms & Concepts: *Hedging, Learning*
- Oct. 19 – **Midterm Exam**
- Oct. 26 – **Derivative Securities**  
Cochrane text, Chpt. 17 (pgs. 313-320)
- Oct. 26 – **The Black-Scholes Formula**  
Black & Scholes (1973), “The Pricing of Options and Corporate Liabilities”  
Black (1989), “How We Came Up with the Option Formula”  
Key Terms & Concepts: *Replicating Portfolio, Delta Hedging, No Arbitrage Pricing, Heat Equation, PDEs*
- Nov. 2 – **The Consumption-Based CAPM Model**  
Lucas (1978), “Asset Prices in an Exchange Economy”  
Cochrane text, Chpt. 1 (pgs. 3-7, 25-30)  
Key Terms & Concepts: *Euler Equation, Stochastic Discount Factor*
- Nov. 2 – **Applications and Extensions of the Lucas Model**  
Class Notes  
Key Terms & Concepts: *The Equity Premium Puzzle, Hansen-Jagannathan Bounds*
- Nov. 9 – **Heterogeneous Beliefs**  
Harrison & Kreps (1978), “Speculative Investor Behavior..with Heterogeneous Expectations”  
Key Terms & Concepts: *Priors, Subjective Beliefs, Merging, Agreeing to Disagree, Resale Option*
- Nov. 9 – **Applications of Heterogeneous Beliefs**  
Scheinkman & Xiong (2003), “Overconfidence and Speculative Bubbles”  
Kasa, Walker & Whiteman (2014), “Heterogeneous Beliefs & Tests of Present Value Models”
- Nov. 16 – **Equivalent Martingale Measures and Risk-Neutral Pricing**  
Harrison & Kreps (1979), “Martingales and Arbitrage in Multiperiod Securities Markets”  
Cochrane text, Chpt. 4 (pgs. 61-75)  
Chpts. 14 & 15 from Neftci’s (1996) book, *Mathematics of Financial Derivatives*  
Key Terms & Concepts: *Self-Financing Portfolio, No Arbitrage, Absolute Continuity, Radon-Nikodym Derivative, Girsanov Theorem, Martingale Representation Theorem, Martingale Method*
- Nov. 23 – **Information and the Grossman-Stiglitz Paradox**  
Grossman & Stiglitz (1980), “On the Impossibility of Informationally Efficient Markets”
- Nov. 30 – **Speculation, Common Knowledge, and No-Trade Theorems**  
Tirole (1982), “On the Possibility of Speculation under Rational Expectations”  
Key Terms & Concepts: *Common Priors, Aumann’s Theorem, Liquidity Traders*