

## Course Syllabus

### Course Description

This is the first course in a program sequence designed to prepare students for research in finance. The program offers a complete exposure to the major concepts and developments of modern finance, and the intention of this, the introductory course, is to provide a basis in the neoclassical theory of finance that underlies the other courses. The course will cover the following topics:

- Arbitrage asset pricing
- Optimal consumption-portfolio choices
- Neo-classic theory of corporate finance
- Static equilibrium models of asset pricing
- Asymmetric information
- Dynamic modeling

Following this course, students should be well prepared for further study of asset pricing theories, corporate finance and econometric work in finance.

### Course Materials

#### REQUIRED:

- *15.470 Lecture Notes*, will be posted on Stellar (<http://stellar.mit.edu/>).
- Ross, *Lecture Notes 15.416, Introduction to Finance: The Static Theories*, Fall 2014.

#### RECOMMENDED:

- Back, *Asset Pricing and Portfolio Choice Theory*, Oxford University Press.
- Leroy and Werner, *Principles of Financial Economics*, Cambridge University Press.
- Cochrane, *Asset Pricing*, Princeton University Press.

- Ingersoll, *Theory of Financial Decision Making*, Rowman & Littlefield.
- Huang and Litzenberger, *Foundations for Financial Economics*, North-Holland.
- Ross, *Neoclassical Finance*, Princeton University Press.
- References to original articles listed in the extended syllabus.

The course will cover much of the material in the recommended books and the first nine chapters of Ingersoll, but the lecture notes are the central material.

### **Prerequisites**

This course is primarily intended for Ph.D. students from the Sloan School and the Economics Department. A thorough understanding of basic finance (at the level of 15.401 + 15.402 or 15.415) and basic probability theory is necessary.

### **Course Requirements and Grading**

The lectures and the required readings are an essential part of the course. The recommended readings are not required, but will be important for students wishing to do research in this field. (Both required and recommended readings are indicated in the course notes.) A number of problem sets will be distributed. You are allowed to discuss problem sets with your classmates, but you should write up the solutions individually. Additional, shorter problems may be assigned before class.

The grade will be determined based on problem sets, the midterm exam and the final exam, counting for 10%, 30%, and 60% of the total grade, respectively. Both exams will be closed-book. The midterm exam will take place during regular class time, while the final exam will take place during the final exam week. You are allowed to bring a one-page two-sided letter-size cheat sheet to the midterm exam, and a two-page two-sided cheat sheet to the final.

**Lectures:** Monday/Wednesday 10:30-12:00, E62-650.

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**Recitations:** TBD

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Course Outline  
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**1. Fundamental Theory of Asset Pricing (Wang)**

- Arrow-Debreu state-space framework
- Arbitrage
- Fundamental theorem of asset pricing (FTAP)
- Market completeness
- State price density and risk neutral measure
- Options and derivative securities
- Asset Pricing Theory (APT)

**2. Optimal Portfolio Choices**

- Preference theory
- Optimal consumption-portfolio choices
- Portfolio choices in complete markets
- Stochastic dominance
- Portfolio separation theorems
- Mean-variance analysis

**3. Neoclassical theory of corporate finance**

- Introduction to corporate finance
- Objectives of a firm and value maximization
- Modigliani-Miller theorem

**4. Static equilibrium models of asset pricing (Kogan)**

- Market equilibrium
- The Capital Asset Pricing Model (CAPM)
- The Consumption-based Capital Asset Pricing Model (C-CAPM)

## **5. Asymmetric Information**

- Asymmetric information in financial markets, Grossman-Stiglitz model
- No-trade theorem
- Rational expectations and market efficiency
- Market micro-structure, Kyle model, Glosten-Milgrom model

## **6. Dynamic Modeling**

- Dynamic state-space framework, FTAP
- Arbitrage asset pricing in a dynamic model
- Dynamic portfolio choice
- Dynamic equilibrium models with complete markets, CCAPM
- Dynamic equilibrium models with incomplete markets