15.415 Finance Theory  
Spring 1999

This subject covers modern capital market theory and some of its applications to corporate finance. The sequence of topics follows Principles of Corporate Finance by Brealey and Myers, but many topics will be covered in more depth than that text provides. The second required text, Taggart's Quantitative Analysis for Investment Management, provides additional formulas and technical details.

15.415 is a prerequisite for all finance electives except 15.437 and for the Financial Management and Financial Engineering Tracks.

There will be two midterms, each counting for 25% of the grade and a final exam counting for 50%. I will round up final grades, for example B+ to A-, where I see consistent effort and informed class participation.

Regular class sessions are scheduled for Monday, Wednesday and Friday mornings. The Friday classes are generally not "recitations." Several class sessions are earmarked for discussion of problem sets and general review, but many of these fall on Mondays and Wednesdays. Most of these classes will be replaced by small-group meetings with the TAs.

Class notes will be available on the Sloan computer network prior to class. Not all of these notes will be covered in class. In some cases students will be asked to review parts of the notes prior to class.

There will be eight ungraded problem sets. Solutions will be posted on the Sloan computer system. Sixty percent of each midterm grade and 40 percent of the final exam grade will be based on questions which should be easy if the problem sets are conscientiously done and understood.

Information on required texts, TAs, office hours, etc. is summarized on the next page.
Required books and periodicals:


*The Wall Street Journal* (daily)

15.415 Readings packet (Graphic Arts)

Recommended:


Teamwork

Problem sets and case preparation can be done by groups.

Teaching Assistants

Stephen Chadwick, cstephen@MIT.Edu
Joon Chae, jchae@MIT.Edu
Wesley Chan, wschan@MIT.Edu
Li Jin, ljin@MIT.Edu
Xiaoyin Zhang, zxiaoyin@MIT.Edu
Office Hours

I will be in my office from 1 - 4 p.m. on Wednesdays. If this is inconvenient, check with Gretchen Schroeder.

Office hours for TAs

(These may change, depending on student demand.)

Monday, Wednesday and Friday from 11:30 - 1:00 p.m. in E52-242.

Administrative Assistant

Gretchen Schroeder, E52-451, 3-3386
slem@MIT.Edu

Grades

50% Two Midterms
50% Final Exam
Course Outline

The following schedule is subject to revision. The exam dates will not be changed.

February 3,5          Introduction

February 8          Present Value
Review of the mechanics of compound interest and present value. READ: B&M, Ch. 3.

February 9,10, 11          Special review sessions on present value calculations, by Wesley Chan. See Problem Set 1. Review sessions in E51-085 on Tuesday, 2/9 from 12-1 p.m.; Wednesday, 2/10 from 12-1 p.m.; Thursday, 2/11 from 5-6 p.m.

February 10,12, 16, 17        Fixed income
Yield curves, term structure, spot and forward rates. Inflation. Foreign exchange and interest rate parity. Duration, volatility and convexity. READ: Taggart, Ch. 1-3; Salomon Brothers Bond Portfolio Analysis Group, "Understanding Duration and Volatility;" (GA), B&M, Ch. 23, 24 (through page 693), 34 (through page 964).

February 19          NO REGULAR CLASS. Replaced by breakout review sessions for Problem Set 2, by Xiaoyin Zhang. Times and rooms TBA.
February 22, 24
Rates of return to investors. Historical risks and returns in bond and stock markets. Random walk hypothesis. Long-run returns and risks. READ: B&M, Ch. 7 (through p. 156), Ch. 13.

Recommended reading. Malkiel, Parts I and II. There will be no direct questions on the Malkiel book on the midterms or final. However, the book is easy and entertaining, and will help put the analytical material covered in class in a practical perspective.

February 26, March 1
Valuation of common stocks
DCF formulas, terminal values, real vs. nominal forecasts and discounting, PVGO, P/Es, etc.
READ: B&M, Ch. 4.

TBA
Breakout review sessions for Problem Set 3 by Li Jin. Times and rooms TBA.

March 3
Capital budgeting basics, for example NPV vs. IRR. Read B&M, Ch. 5.

March 5, 8
Capital budgeting applications
CASE: Newest Economy Shipping. Project interactions and equivalent annual costs. Capital budgeting in practice. READ: B&M, Ch. 6, 11, 12.

March 10
NO REGULAR CLASS. Replaced by breakout review sessions for Problem Set 4, by Xiaoyin Zhang. Times and rooms TBA.

March 12
First midterm exam

March 15, 29
Portfolio theory
Calculating portfolio variance. Efficient risk-return tradeoffs. Micro and macro risks. READ: Taggart, Ch. 10; B&M, Ch. 7, 8 (through p. 179). CASE: Marathon Investments.
March 17, 19 NO CLASSES. Sloan classes cancelled for MBA field trips.

March 31  
April 2  CAPM and the cost of capital

Assumptions and derivation. Measuring and predicting betas. Interpreting alphas, $R^2$s, etc. Using the CAPM to estimate opportunity cost of capital. Levering and unlevering betas. READ: Taggart, Ch. 11; B&M, Ch. 8 (through page 188), 9. Recommended reading: Malkiel, Part III.

April 5 Multifactor CAPMs and arbitrage pricing theory. READ: B&M, Section 8-4. Elton, Gruber and Mei, "Cost of Capital Using Arbitrage Pricing Theory" (GA).


TBA Breakout review sessions on Problem Set 5 by Li Jin. Times and room TBA.

April 9 NO CLASS (Diversity workshops)

April 12 Dividend policy. Alternative tax systems. READ: B&M, Ch. 16.

April 14, 16 Modigliani-Miller propositions and the weighted average cost of capital. READ: B&M, Ch. 17, 18, 19 (new version to be handed out).

TBA Breakout review sessions for Problem Set 6 by Joon Chae. Times and room TBA.

April 21 Second midterm exam

April 23, 26, 28 Futures and swaps

Financial and commodity futures. Interest rate and currency swaps. READ: Taggart, Ch. 8; B&M, Ch. 25.
April 30
NO REGULAR CLASS. Replaced by breakout review sessions for Problem Set 7, by Stephen Chadwick. Times and room TBA.

May 3-10
Options


May 8
Problem Set 8 to be completed by this date. Breakout review sessions by Stephen Chadwick. Times and room TBA.

May 12
LAST CLASS. Review.

TBA
Final Exam