Professor Steven V. Mann  
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Office: 456I  
Phone: 777-4929  
Office Hours: TR 2:30-4:00  
Class time: TR 8:30-11:20  
Website: All lecture notes and course information will be available on Blackboard.

Course Objectives and Overview

This course is designed to provide extensive coverage of the wide range of fixed-income products and the tools employed by market participants to analyze them. The level of the presentation is the same as one would experience attending fixed-income training programs at dealer firms on Wall Street. Your instructor has taught in these programs for the following firms – Citigroup, Bank of America, Wachovia, Barclays, Merrill Lynch, Freddie Mac, Wells Fargo and others.

The key feature of Fixed Income Securities is that it strongly emphasizes the applications of the material presented in class to problems/situations encountered by market participants. The course, which is fairly quantitative in nature, includes many real world exercises that require the student to use the Bloomberg terminal.

The specific objectives of the course are listed below:

1. **Immerse the student in the fundamental principles of fixed-income securities with a special emphasis on structured products.**

2. **Deepen the student’s understanding of fixed-income valuation models including the valuation of bonds with embedded options.**

3. **Give each student the opportunity to solve problems encountered by practitioners in fixed-income markets.**

Required Textbook

**Administrative Notes**

**Office hours:** Although I have formal office hours on Monday and Wednesday afternoons, I encourage you to call or stop by my office whenever you have a question or problem. The following caveats to the above are:

1. I am occasionally under time pressure on a project and will need to answer your question at a mutually convenient time.

2. If you expect you need a long meeting, please attempt to arrange a mutually convenient meeting time with me first.

**Students will have**

**Course Requirements**

Students will have multiple opportunities to demonstrate their mastery of the course material. These opportunities consist of the following:

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<tr>
<td>Exams</td>
<td>80%</td>
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<td>Cases</td>
<td>20%</td>
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<td><strong>Total</strong></td>
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The format for the exam will be a combination of problems and multiple choice questions. Caselets will be assigned throughout the semester and caselet will involve the use of the Bloomberg terminal and/or Excel as well as some mathematics.

Exam I is on Thursday, February 11. Exam II will be last day of class. Without exception, everyone must take the exams on the scheduled dates, i.e., no exam will be administered at a different time.
Grading Policy

The course grades will be computed to obtain a class grade point average of approximately 3.4. I base the course grade on total points. I start with a straight scale 90% and above is an A, 80% and above is a B, and so forth. The class grade point average is calculated. If the class grade point average is 3.4 or higher, I assign grades based on that scale. If the grade point average is below 3.4, I drop the scale by one percent and repeat the process. When the target grade point average is achieved, I assign grades.

Regrade policy: If you think that a serious error has been committed in grading your exam, you must submit the exam for a complete regrade along with a detailed written explanation of your objection within 10 business days of receiving the graded exam. There is absolutely no guarantee that the regrade will result in a higher score. The score may be higher, lower or the same.

Please adhere to the Honor Code in your study of fixed-income.

University of South Carolina Honor Code:

It is the responsibility of every student at the University of South Carolina Columbia to adhere steadfastly to truthfulness and to avoid dishonesty, fraud, or deceit of any type in connection with any academic program. Any student who violates this Honor Code or who knowingly assists another to violate this Honor Code shall be subject to discipline.
Learning Outcomes
FINA 770
Fixed Income Securities

Professor Steven V. Mann

The following represents a list of things that we will discuss in our course. It should prove useful when preparing for the exam.

Explain the general features of fixed-income securities, floaters, inverse floaters, caps and floors, call and refunding provisions, and sinking funds.
Identify and explain the risks associated with investing in fixed-income securities.
Calculate a bond value with traditional bond valuation
Explain the importance of the shape of the price/yield relationship for an option-free bond.
Explain why bonds change in price.
Understand the process of valuing bonds between coupon payment dates including day count conventions, clean price, accrued interest, and the full price.
Explain the par curve and how is it calculated.
Explain the spot curve and how are spot rates calculated.
Calculate a spot rate.
Distinguish between spot rates vs. strip rates
Explain what forward rates are and how are they calculated
Calculate a forward rate
Explain how par rates, spot rates and forward rates are related to each other.
Discuss in some detail the types of yield curve shifts and how are they related.
Explain how implied forward rates are the market’s expectations of future spot rates/
Explain how forward rates serve as break-even rates.
Explain how arbitrage-free valuation works.
Explain how stripping/reconstitution works.
Explain the three sources of dollar returns from investing in bonds.
Calculate and interpret current yield.
Explain how to calculate yield to maturity with the bond pricing formula.
Explain how to calculate yield to call/yield to worst with the bond pricing formula.
Explain how the following are calculated: discounted margin, cash flow yield, nominal spread, and zero-volatility spread
Explain the importance of the curvature of the price/yield relationship
Calculate and interpret Modified duration
Explain what dollar duration tells us.
Calculate and interpret Macaulay duration
List and explain the properties of Macaulay duration.
Explain how are modified and Macaulay duration related.
Explain what the convexity measure tells us.
Explain how convexity and duration are related.
Calculate and interpret the approximate percentage price change due to convexity.
Explain and interpret the properties of convexity.
Explain the value of convexity.
List and interpret the implications of barbell/bullet analysis.
Define and interpret effective duration/convexity.
Define and interpret the negative convexity for callable bonds.
Explain how key rate duration works.
Calculate and interpret the total return for a bond held to maturity.
Explain scenario analysis
Explain how portfolio total return is calculated.
Calculate the discount of a Treasury bill.
Calculate the yield on a bank discount basis.
Explain how Treasury bills are auctioned.
Define and contrast a single price auction vs. multiple price auction.
Explain what is special about quarter end bills.
Explain what is meant by a primary dealer.
Explain what dealer brokers do.
Define in some detail the following terms: Treasury inflation protected securities, Federally related institutions securities, GSE securities, features of municipal securities, general obligation vs. revenue, insured bonds, refunded bonds, quality spreads, and spreads between general market and in-state issues.
Explain how a binomial interest rate tree is built and how it is used to value bonds with embedded options.
Explain and interpret option-adjusted spread.
Explain the basic features of a mortgage loan.
Explain what prepayments are and why they are critical.
Define in some detail the following terms: mortgage pass-through, servicing fees, guarantee fees, conditional prepayment rate, single monthly mortality rate given CPR, PSA standard prepayment model, extension risk, contraction risk, conventional pass-throughs, CMOs, CMO floaters, planned amortization class securities, and stripped MBS.
Discuss the basic features of a hybrid mortgage
Explain what types of borrowers utilize interest-only mortgages.
Define in some detail the following structures: sequential-pay structures and accrual (Z) bonds.
Explain how an interest rate swap works.
Explain how is a swap’s fixed rate determined.
Explain how is a swap’s value affected by changes in interest rates.
Explain how are a swap’s floating payments determined.
Explain how a portfolio manager adds value relative to a benchmark.
Discuss in some detail the steps for determining an asset swap spread.
Explain how a repurchase agreement works.
Explain how a reverse repurchase agreement differs from a repo.
Calculate and interpret repo interest.
Define in some detail the following terms: types of credit enhancement for ABS, pay-throughs, and amortizing vs. non-amortizing collateral.
Discuss in some detail securitization processes.
Define in some detail the following terms: special purpose vehicle, true sale, and bankruptcy-remote.
Explain how credit default swaps work.
Explain the securities lending process works.
Discuss the importance of cash collateral and collateral pools.
Explain the features of convertible securities.
Discuss in some detail convertible bond arbitrage.
Explain the process for structuring collateralized debt obligations, structured investment vehicles, and structured investment vehicles-lite.
Explain the motivation behind insurance-linked securities.
Explain the notion of longevity risk.