Course Objectives

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 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 very quantitative in nature and requires understanding and explaining concepts beyond knowing formulas.

The specific objectives of the course are listed below:

- Immerse the student in the fundamental principles of fixed-income securities and an introduction to portfolio management basics.
- Deepen the student’s understanding of fixed-income valuation models.
- Give each student the opportunity to solve problems encountered by practitioners in fixed-income markets.

Required Textbook


Technology: A financial calculator or equivalent tool with a bond valuation module. Access to a Bloomberg is helpful. Access to Excel (PC Version – not MAC) and Yield Book add-in for the Portfolio Project.

Grades:

- Exam I: 20%
- Exam II: 25%
- Final Exam: 30%
- Group Project: 10%
- Career Chat: 5%
- Contribution to Class: 10%
Exams

The format for all three exams will be mixture of short essay, multiple choice, and problems. **Exam I** is on **Thursday, February 9th** during the regularly scheduled class period. **Exam II** is on **Thursday, March 23** during the regularly scheduled class period. (Our last day of class is **Thursday, April 20th**.) According to the official final examination schedule, the **Final Exam** will be on **Tuesday May 2nd at 4:00pm (2.5 hours)**. **Everyone must take the exams on the scheduled dates.**

Grade Scale

All assignments and tests will be scored out of 100 points, and then weighted by the percentages listed above. The overall percentage score will determine your final grade. If you achieve an overall percentage in the ranges below, you will receive at worst the letter grade associated with that range. It is possible that grades will be curved at the end of the semester, so that some scores in a particular range will obtain a letter grade associated with a higher range. For example, it is possible that a 77 overall average could result in a B grade.

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Grade</th>
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<tbody>
<tr>
<td>90-100</td>
<td>A</td>
</tr>
<tr>
<td>87-89</td>
<td>B+</td>
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<tr>
<td>80-86</td>
<td>B</td>
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<td>77-79</td>
<td>C+</td>
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<td>70-76</td>
<td>C</td>
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<tr>
<td>60-69</td>
<td>D</td>
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<td>&lt; 60</td>
<td>F</td>
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</tbody>
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Classroom Expectations

To encourage you to contribute to class, your grade depends on my subjective assessment of your contribution to class over the semester. You start the semester with a grade for contribution to class equal to 6/10. You can increase that grade by contributing to class in a positive manner (e.g., participation, facilitating discussion, asking about market-based current events). You can decrease that grade by not attending class regularly or attending and not being focused.

Career Chats

One of my responsibilities is developing and providing “Career Management and Guidance” for Finance majors. This will include mentoring individuals such as yourselves - so we get to meet! More details on this will be discussed in class. **No career chats will be scheduled after April 18th.**

Group Project

We will have a fixed income portfolio vs an Index project. You will purchase a US Treasury bond portfolio and measure its risk and performance against a benchmark for the month of March. Each team will produce a report and present their results. The size of each group will be determined later. I will assume all group members will contribute equally, so it’s up to you to ensure that happens. Projects handed in after the deadline will lose 50% after the first day and will not be accepted after the second day.
Learning Objectives

The following represents a list of things I trust you will learn this semester. NOTE: For now, this is a fluid list and I may change the order, delete or add topics based on the direction we take. I will make it very clear what will be covered on any particular 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 it is calculated.
- 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.
- 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 the value of convexity.
- List and interpret the implications of barbell/bullet analysis.
- Define and interpret the negative convexity for callable bonds.
- Calculate and interpret the total return for a bond held to maturity.
- Explain scenario analysis.
- Explain how portfolio total return is calculated.
- Review Fixed Income Benchmarks and how they are used in practice by portfolio and risk managers.
- Explain how a portfolio manager adds value relative to a benchmark.
• Define in some detail the following terms: Treasury inflation protected securities, Federal-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 the spot curve and how are spot rates calculated.
• Calculate a spot rate.
• Distinguish 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 basic features of a mortgage loan and loan amortization.
• Explain what prepayment models are and why they are critical to mortgage investors
• Define in some detail the following terms: mortgage pass-through, servicing fees, guarantee fees, conditional (constant) prepayment rate, single monthly mortality rate given CPR, PSA standard prepayment model, extension risk, contraction risk, conventional pass-throughs, CMOs, and stripped MBS.
• Define in some detail the following structures: CMO sequential-pay structures and accrual (Z) bonds.
• Explain how an interest rate swap works.
• Explain how a swap’s fixed rate is determined.
• Explain how a swap’s value is affected by changes in interest rates.
• Explain how a swap’s floating payments are determined.
• Discuss in some detail the steps for determining an asset swap spread.
• 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.
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.

This Honor Code is intended to prohibit all forms of academic dishonesty and should be interpreted broadly to carry out that purpose. The following examples illustrate conduct that violates this Honor Code, but this list is not intended to be an exhaustive compilation of conduct prohibited by the Honor Code:

1. Giving or receiving unauthorized assistance, or attempting to give or receive such assistance, in connection with the performance of any academic work.

2. Unauthorized use of materials or information of any type or the unauthorized use of any electronic or mechanical device in connection with the completion of any academic work.

3. Access to the contents of any test or examination or the purchase, sale, or theft of any test or examination prior to its administration.

4. Use of another person’s work or ideas without proper acknowledgment of source.

5. Intentional misrepresentation by word or action of any situation of fact, or intentional omission of material fact, so as to mislead any person in connection with any academic work (including, without limitation, the scheduling, completion, performance, or submission of any such work).

6. Offering or giving any favor or thing of value for the purpose of influencing improperly a grade or other evaluation of a student in an academic program.

7. Conduct intended to interfere with an instructor’s ability to evaluate accurately a student’s competency or performance in an academic program.

Whenever a student is uncertain as to whether conduct would violate this Honor Code, it is the responsibility of the student to seek clarification from the appropriate faculty member or instructor of record prior to engaging in such conduct.

Suspected violations of the honor code will be reported to the Office of Academic Integrity. Violations of the honor code will result in disciplinary measures.

For more information about academic integrity issues, go to the following website:

https://www.sa.sc.edu/academicintegrity/

As of January 1, 2017