

# **FNCE 2250 Fixed Income Securities**

## **Spring 2023**

### **Syllabus**

#### **Instructor**

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Zoom office hours: Friday 11.00am – 12.30pm

I am available to meet with you during office on my zoom channel. Please make an appointment if you want to meet on other days, either in-person or virtual. Teaching Assistants will also hold office hours; their times will be posted on the Canvas course page.

#### **Course Description**

This course covers the valuation and application of a wide variety of fixed income securities and their derivatives. Fixed income securities are financial claims including pure discount bonds, coupon bonds such as Treasury notes and corporate bonds, floating rate notes, callable bonds, among many others, issued by public or private entities. In the first half of the course, we focus on yield curve construction, duration and convexity, and formal term structure models. The goal is to introduce you to at least one equilibrium model and one no-arbitrage model, and to analytical tools used in interest rate modeling and risk management.

In the second half of the course, we first focus on interest rate derivatives such as interest rate swaps and options, including caps, floors, and swaptions. We will examine the popular SABR volatility model, and discuss the transition of the market for IRDs to a state without LIBOR. We also look beyond interest rate risk, and study other risks that can be inherent in fixed income securities such as credit risk, illiquidity risk, and the risks stemming from securitization. For example, we will study a structural model to understand the sources of credit risk more deeply, and will examine the securitizations used to create Islamic bonds. The course concludes with a discussion about credit derivatives.

## **How FNCE 2250 relates to other classes at Wharton**

Students must have taken Corporate Finance and Statistics before enrolling into Fixed Income Securities. It is also useful to know the material covered in Macroeconomics and the Global Economy, but the course is not a prerequisite.

Financial Derivatives (FNCE 2170) also covers derivative securities outside of the area of fixed income. Capital Markets (FNCE 2380) covers some bond market segments that I do not cover plus of course other asset classes such as equity. International Financial Markets (FNCE 2190) also deals with some of the derivatives that you learn about in my class, though the applications tend to be within exchange rates, money markets, and currency derivatives.

## **Class Meetings & Recordings**

We meet Mondays and Wednesdays in JMHH F90. We start class on January 18, and not on the 11th. Instead, we will meet for an additional session in April outside of regular class time. All standards in our [Learning Agreement](#) apply. Please turn off and put away your phones, they are too distracting for you and the students around you. You may use tablets for notetaking purposes.

I expect students to attend all sessions. Please respect the classroom as an inclusive learning environment where diverse points of view and experiences can be shared to facilitate everyone's learning. If you cannot attend a session due to an excused absence, then I can make a recording available. Requesting a recording for additional review of the material is also fine.

## **Course Materials**

1. I will post lecture slides and reading material on the course page on Canvas.
2. 'Adventures in Debentures' is a course pack created by Prof. Michael Gibbons during the many years he taught this course. I will make it available to you via Canvas. Please note, we will not cover all chapters of this course pack. I will outline which chapters are relevant.
3. This course does not have a required textbook, but I am suggesting three textbooks that cover most of the material we will cover in class.

Frank Fabozzi, Bond Markets, Analysis, and Strategies, Pearson

Suresh Sundaresan, Fixed Income Markets and Their Derivatives, Elsevier;  
Elsevier had announced a fourth edition to be published, but has not delivered thus far.

Pietro Veronesi, Fixed Income Securities, Wiley

All three books are very helpful in mastering the material as well as a general reference on the subject. I will show you how topics covered in this class map into ‘Adventures in Debentures’ and ‘Fixed Income Markets and Their Derivatives.’

4. Academic articles. I will expose you to some important academic articles in this class. The list of academic articles includes ...

On the Pricing of Corporate Debt: The Risk Structure of Interest Rates, 1973, Robert Merton, Journal of Finance

Common Factors Affecting Bond Returns, 1991, Robert Litterman and Jose Scheinkman, Journal of Fixed Income

The Determinants of Credit Spread Changes, 2001, Collin-Dufresne, Goldstein and Martin, Journal of Finance

The Illiquidity of Corporate Bonds, 2011, Bao, Pan and Wang, Journal of Finance

Default Risk of Advances Economies: An Empirical Analysis of Credit Default Swaps during the Financial Crisis, 2011, Dieckmann and Plank, Review of Finance

Investor Flows and Fragility in Corporate Bond Funds, 2017, Goldstein, Jiang, Ng, Journal of Financial Economics

The Myth of the Credit Spread Puzzle, 2018, Feldhuetter and Schaefer, Review of Financial Studies

Dissecting green returns, 2022, Pastor, Stambaugh, Taylor, Journal of Financial Economics

## **Attendance & Participation**

My goal is to make the classroom environment as engaging as possible. Your focused attention and active involvement are important. In addition, we will be using Ed Discussion for some asynchronous class discussion. Rather than emailing questions, I encourage you to post your questions on Ed Discussion. I will post a score for attendance & participation at the halfway point, and at the end of the semester.

## **Exams**

This course has two exams, on March 1 and April 26. Both exams are mandatory. Each exam will count for 25% of your final grade. They will be online exams to be taken using the Canvas platform in a proctored classroom in JMHH.

If you would like to appeal a grade, please provide a written statement to me or the teaching assistants as to why there is a problem. All re-grade requests must be submitted within one week after the results have been posted.

## **Problem Sets and Final Project**

Six problem sets will be assigned during the semester. The purpose of the problem sets is to increase your learning of the material, provide feedback, and help you prepare for the exams. Problem sets may be solved in groups (up to four students), and to be handed in as one write-up per group. The five best problem sets will count for 15% of your final grade, equally weighted. Tentative due dates are marked with an asterisk in the course schedule.

And then there is a final project, worth 25% of your final grade, due on April 19. In the past I have given a final project consisting of two parts, equally weighted, and my plan is to do the same this Spring. The first part is typically about bond pricing and interest rate risk, the second part is typically about another risk inherent in fixed income securities that we cover in the second part of the class. Students may prepare a write-up in groups (up to four students), and the submission should be joint as well. Please limit the write-up to four pages of text; you can add tables or graphs.

## Summary

Class attendance and participation: 10%

First exam: 25%

Second exam: 25%

Problem sets: 15%

Final project: 25%

## Ethics Matrix

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	Materials							People				
FNCE 2250 Fixed Income Securities	Calculator	Laptop / other electronics	Summary sheet	Textbooks / Class Notes	Past notes / summaries	Past exams / problems	Internet content / other outside materials	Group of 4	Other student(s) in same section	Student(s) in other sections (same term)	Wharton student not taking the class this term	Person outside of Wharton
Problem Sets	A	A		A			A	W	D	D		
Final Project	A	A		A			A	W	D	D		
Exam Preparation	A	A	A	A		A	A	W	W	W		
Exam 1	A	A	A	A			A					
Exam 2	A	A	A	A			A					
	A = Allowed material Shaded Cell = Not allowed							W = Allowed to work together D = Discussion of general concepts and procedures is allowed but no sharing of specific answers. Shaded Cell = Not allowed				
The information above covers many common situations but will not cover every circumstance. Remember: The Code of Ethics that you accepted requires, among other things, that you represent yourself and your work honestly, don't try to gain unfair advantage over other students, follow the instructor's guidelines and respect confidentiality of your work and the work of others. Should you have questions, please contact your ethics liaison or professor.												

## FNCE 2250 Course Schedule (tentative as of November 29, 2022)

<b>Class</b>	<b>Date</b>	<b>Topic</b>
1	Jan 18 – Wednesday	Overview of Fixed Income Securities
2	Jan 23 – Monday	Bond Valuation using Synthetics
3	Jan 25 – Wednesday	Interpreting Bond Yields
4	Jan 30 – Monday	Bond Values and the Passage of Time / Theta
5	Feb 1 – Wednesday	Forward Rates / Contracts
6	Feb 6 – Monday *	Risk Measurement / Delta
7	Feb 8 – Wednesday	Risk Measurement / Gamma
8	Feb 13 – Monday	Delta, Gamma, and Theta
9	Feb 15 – Wednesday *	Term Structure Modeling I
10	Feb 20 – Monday	Term Structure Modeling I, including Vasicek model (equilibrium model)
11	Feb 22 – Wednesday	Term Structure Modeling II, including Black-Derman-Toy (No-Arbitrage model)
12	Feb 27 – Monday *	Review for Exam 1
13	Mar 1 – Wednesday	Exam 1
	Mar 6 – Monday	Spring break – no class
	Mar 8 – Wednesday	Spring break – no class
14	Mar 13 – Monday	Orange County
15	Mar 15 – Wednesday	Interest Rate Derivatives and CME Bond Options
16	Mar 20 – Monday	Floating Rate Notes, Interest Rate Swaps, LIBOR transition
17	Mar 22 – Wednesday *	Interest Rate Options, Black's Model and SABR volatility model
18	Mar 27 – Monday	Callable Bonds
19	Mar 29 – Wednesday	Corporate Bonds
20	Apr 3 – Monday *	Modeling Credit Risk, including the Merton Model
21	Apr 5 – Wednesday	Illiquidity in Bond Markets
22	Apr 10 – Monday	Securitization I
23	Apr 12 – Wednesday *	Securitization II / Islamic Bonds
24	Apr 17 – Monday	Credit Derivatives
25	Apr 19 – Wednesday	Wrap Up
26	Apr 24 – Monday	Review for Exam 2
27	Apr 26 – Wednesday	Exam 2

A 28<sup>th</sup> session will be held in April, outside of regular class time. This session will be dedicated towards the final project.