

FBE-599:
MODELING INTEREST RATE RISK, HEDGING & MITIGATION
Spring 2023
1.5 units

This course will meet Tuesdays & Thursdays at 3pm in JKP 212

Instructor: Mark D. Griffiths
Office:
Office Hours: Days and Times and by appointment
Phone:
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COURSE DESCRIPTION

In this course, students will learn how to analyze advanced financial situations and to present the analysis in a coherent and professional manner. The vehicle used for developing such models is the familiar spreadsheet Excel. Students will learn how to design specialized Excel tools and models to evaluate financial problems not covered by built-in Excel functions.

Specifically, students will learn modern techniques to perform such tasks as:

- Analyzing the effects of interest rate risk.
- Mitigation methods for dealing with interest rate risk (Duration, FRAs, Swaps).
- Understanding the role of the yield curve in seeking arbitrage opportunities.
- Understanding the pricing and risks of coupon bonds, zero coupon bonds and STRIPS.

COURSE OBJECTIVES

Upon successful completion of this course, students will be able to:

- (1) Make effective financial decisions in an uncertain business context (fixed income) in a timely manner by applying principles.
- (2) Perform financial analysis in an efficient and creative manner for target audience approval.
- (3) Describe the role of the “no- arbitrage” conditions.
- (4) Make effective quantitative and graphical presentations.
- (5) Clearly and concisely convey the impact of change on different aspects of the financial analysis (the effect of different yield curves).
- (6) Explain the value of the role of a financial analyst as a team player in a complex (fixed income) investment environment.
- (7) Describe the types of individuals and employment expectations in an I-Banking/ Private Equity context.

COURSE MATERIALS

- (1) Mark D Griffiths & Tal Weiss, Modeling Issues in Interest Rate Risk, (Wkshp) *available electronically at amazon.com*. (Required). Download Excel Templates and Read-only Solutions from alternate web site indicated on the Amazon web page.
- (2) Financial Calculator: Texas Instruments BAII – Plus (or Equivalent) (Required)
- (3) Laptop computer with Excel installed. Students can download the latest version of Excel (and MS office for free) using this link: <https://itservices.usc.edu/officestudents/>. (Required)

COMPUTERS AND SOFTWARE

You are required to have access to Excel 2016 running under Windows either on your own Mac or PC or via the Marshall Virtual Lab, which allows Marshall students to use a virtual desktop in the Marshall private cloud. **If you have a Mac and want to run Excel 2016 under Windows on your own laptop, you will need to check if you have enough memory to run Windows through a Windows emulator such as Boot Camp or Parallel.** If you want the software on your own computer, you can take advantage of the free version of Windows and Office 365 provided by USC. (Fertitta Hall, Room 305)

You are welcome to use your computers in class as long the devices are used for the specific problem (Workshop/caselet) the professor is working on. They are not to be used for any other purpose.

Announcements and lecture materials are available on the course BlackBoard site. If you have any questions or need assistance with the Blackboard Course Pages, please contact the Marshall HelpDesk at 213-740-3000 (option 2) or HelpDesk@marshall.usc.edu. Alternatively, (213) 740-5555 will get you the USC ITS Help Desk

GRADING

Assignments	% of Overall Grade
Contributions & Professionalism	10%
Mid-Term Exam	45%
Final Exam	45%
TOTAL	100%

Note: This is a hands-on course in which students are expected to work collaboratively in class to solve the issues raised in the various caselets (workshops). It is also possible that there is not sufficient in-class time to complete the caselet (workshop). Hence, students are expected to work outside of the classroom to complete the workshop. The effort outside of the classroom can continue to be collaborative. Exams must represent the student's individual effort.

1. **Contributions & Professionalism (10%).** A student earning this grade will be engaged in class discussions, which means he/she will answer questions if called upon, if not correctly, then at least in a way that shows he/she was paying attention and understands the question, and will raise relevant questions and comments from time to time. Higher grades will be assigned to students who are more actively engaged in the class discussion; lower grades will be assigned to students who do not seem to be fully engaged in the class discussion, for example, having little or nothing to say when called upon. A grade of zero in participation is possible.

2. **Mid-term Exams (45%).** There will be one mid-term exam. **No make-ups exams will be given.** A grade of zero for a missed exam will be awarded unless a written excuse from your doctor or the USC Health Center is provided to the instructor prior to the exam. The exams will be open book/computer and assigned on a take-home basis.

3. **Final Exam (45%).** The final exam will be scheduled according to the University's Final Exam Schedule. If you miss the final exam for a medical emergency reason that can be documented and verified, there will be a makeup final to be arranged as soon as possible. Otherwise, a grade of zero will be assigned to the final exam. <https://classes.usc.edu/term-20201/finals/>

Final grades represent the student's performance in the class relative to other students. The rank of the weighted average of class participation, homework, mid-term exams and final exam will be compared to others in the class and used to determine the grade. The average grade for this class is expected to be about 3.5.

THE IMPORTANCE OF COURSE EVALUATIONS

The student course evaluations are valuable. This course is continuously improved, based on feedback from students and instructor observations.

EMERGENCY PREPAREDNESS

In case of a declared emergency if travel to campus is not feasible, the USC Emergency Information web site (<https://emergency.usc.edu/>) will provide safety and other information, including electronic means by which instructors will conduct class using a combination of USC's Blackboard learning management system (blackboard.usc.edu), teleconferencing, and other technologies.

OPEN EXPRESSION AND RESPECT FOR ALL

An important goal of the educational experience at USC Marshall is to be exposed to and discuss diverse, thought-provoking, and sometimes controversial ideas that challenge one's beliefs. In this course we will support the values articulated in the USC Marshall "[Open Expression Statement](#)."

COURSE OUTLINE AND ASSIGNMENTS

	Lecture	Financial Application	Topics/ Activities	In-Class Exercises & Readings	Assignments (Caselets from Req'd Text)
<i>Week 1</i>	1 1/10	Modeling bond pricing issues	Introduction to price scallops and sawtooth issues	<i>Lecture</i>	<i>Wkshp: 1. Pricing issues</i>
	2 1/12	Modeling interest rate risk	Introduction to Macaulay duration & modified duration	<i>Lecture</i>	<i>Wkshp: 2. Duration sawtooth</i>
<i>Week 2</i>	1 1/17	Reconciling issues in Duration measurement	Introduction to duration crossovers	<i>Lecture</i>	<i>Wkshp: 3. Duration crossovers</i>
	2 1/19	Modeling interest rate risk (cont'd)	Introduction to dollar duration and applications	<i>Lecture</i>	<i>Wkshp: 4. Duration Hedging</i>
<i>Week 3</i>	1 1/24	Modeling interest rate risk in portfolio	Integration of risk measures	<i>Lecture</i>	<i>Wkshp: 5. Portfolio risk measurement</i>
	2 1/26	Modeling cumbersome duration issues	Calculating annuity durations	<i>Lecture</i>	<i>Wkshp: 6. Handling annuity duration problems</i>
<i>Week 4</i>	1 1/31	<i>Midterm Exam</i>			
	2 2/02	Applying interest rate risk mitigation	Corporate application on mitigating interest rate risk with duration	<i>Lecture</i>	<i>Wkshp: 7. Application to WACC</i>
<i>Week 5</i>	1 2/07	Managing perceived interest rate risk through the yield curve	Understanding STRIPS & Portfolio YTM	<i>Lecture</i>	<i>Wkshp: 8. Arbitraging STRIPS & bonds</i>
	2 2/09	Managing future interest rate risk	Modeling Forward Rate Agreements	<i>Lecture</i>	<i>Wkshp: 9. FRAs</i>
<i>Week 6</i>	1 2/14	Managing future interest rate risk (cont'd)	Modeling Vanilla Interest Rate Swaps	<i>Lecture</i>	<i>Wkshp: 10. Swaps</i>
	2 2/16	Managing future interest rate risk (cont'd)	Modeling non-standard interest rate swaps	<i>Lecture</i>	<i>Wkshp: 11. More swaps</i>
<i>Week 7</i>	1 2/21	Catch-up day			
	2 2/23	Course Review			
<i>Week 8</i>	1 2/28	Final Exam			

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STATEMENT ON ACADEMIC CONDUCT AND SUPPORT SYSTEMS

Academic Conduct:

Plagiarism – presenting someone else’s ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in SCampus in Part B, Section 11, “Behavior Violating University Standards” policy.usc.edu/scampus-part-b. Other forms of academic dishonesty are equally unacceptable. See additional information in SCampus and university policies on [Research and Scholarship Misconduct](#).

Students and Disability Accommodations:

USC welcomes students with disabilities into all of the University’s educational programs. The Office of Student Accessibility Services (OSAS) is responsible for the determination of appropriate accommodations for students who encounter disability-related barriers. Once a student has completed the OSAS process (registration, initial appointment, and submitted documentation) and accommodations are determined to be reasonable and appropriate, a Letter of Accommodation (LOA) will be available to generate for each course. The LOA must be given to each course instructor by the student and followed up with a discussion. This should be done as early in the semester as possible as accommodations are not retroactive. More information can be found at osas.usc.edu. You may contact OSAS at (213) 740-0776 or via email at osasfrontdesk@usc.edu.

Support Systems:

Counseling and Mental Health - (213) 740-9355 – 24/7 on call
studenthealth.usc.edu/counseling

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

National Suicide Prevention Lifeline - 1 (800) 273-8255 – 24/7 on call
suicidepreventionlifeline.org

Free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week.

Relationship and Sexual Violence Prevention Services (RSVP) - (213) 740-9355(WELL), press “0” after hours – 24/7 on call
studenthealth.usc.edu/sexual-assault

Free and confidential therapy services, workshops, and training for situations related to gender-based harm.

Office for Equity, Equal Opportunity, and Title IX (EEO-TIX) - (213) 740-5086
eeotix.usc.edu

Information about how to get help or help someone affected by harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants.

Reporting Incidents of Bias or Harassment - (213) 740-5086 or (213) 821-8298
usc-advocate.symplicity.com/care_report

Avenue to report incidents of bias, hate crimes, and microaggressions to the Office for Equity, Equal Opportunity, and Title for appropriate investigation, supportive measures, and response.

The Office of Student Accessibility Services (OSAS) - (213) 740-0776
osas.usc.edu

OSAS ensures equal access for students with disabilities through providing academic accommodations and auxiliary aids in accordance with federal laws and university policy.

USC Campus Support and Intervention - (213) 821-4710
campussupport.usc.edu

Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

Diversity, Equity and Inclusion - (213) 740-2101
diversity.usc.edu

Information on events, programs and training, the Provost's Diversity and Inclusion Council, Diversity Liaisons for each academic school, chronology, participation, and various resources for students.

USC Emergency - UPC: (213) 740-4321, HSC: (323) 442-1000 – 24/7 on call
dps.usc.edu, emergency.usc.edu

Emergency assistance and avenue to report a crime. Latest updates regarding safety, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible.

USC Department of Public Safety - UPC: (213) 740-6000, HSC: (323) 442-120 – 24/7 on call
dps.usc.edu

Non-emergency assistance or information.

Office of the Ombuds - (213) 821-9556 (UPC) / (323-442-0382 (HSC)
ombuds.usc.edu

A safe and confidential place to share your USC-related issues with a University Ombuds who will work with you to explore options or paths to manage your concern.

Occupational Therapy Faculty Practice - (323) 442-3340 or otfp@med.usc.edu
chan.usc.edu/otfp

Confidential Lifestyle Redesign services for USC students to support health promoting habits and routines that enhance quality of life and academic performance.

Appendix I. MARSHALL GRADUATE PROGRAMS LEARNING GOALS

How FBE 599 Contributes to Marshall Graduate Program Learning Goals

Marshall Graduate Program Learning Goals	FBE 599 Objectives that support this goal	Assessment Method*
<p><i>Learning Goal #1: Develop Personal Strengths.</i> Our graduates will develop a global and entrepreneurial mindset, lead with integrity, purpose and ethical perspective, and draw value from diversity and inclusion.</p>	Objectives 1, 4, 6	Exams
1.1 Possess personal integrity and a commitment to an organization's purpose and core values.	2, 3, 5, 6	Exams
1.2 Expand awareness with a global and entrepreneurial mindset, drawing value from diversity and inclusion.		
1.3 Exhibit awareness of ethical dimensions and professional standards in decision making.	1, 2, 3, 4, 5, 6	Exams
<p><i>Learning Goal #2: Gain Knowledge and Skills.</i> Our graduates will develop a deep understanding of the key functions of business enterprises and will be able to identify and take advantage of opportunities in a complex, uncertain and dynamic business environment using critical and analytical thinking skills.</p>	1, 2, 3, 4, 5, 6	Exams
2.1 Gain knowledge of the key functions of business enterprises.	1, 2, 3, 4, 5, 6	Exams
2.2 Acquire advanced skills to understand and analyze significant business opportunities, which can be complex, uncertain and dynamic.	1, 2, 3, 4, 5, 6	Exams
2.3 Use critical and analytical thinking to identify viable options that can create short-term and long-term value for organizations and their stakeholders.	1, 2, 3, 4, 5, 6	Exams
<p><i>Learning Goal #3: Motivate and Build High Performing Teams.</i> Our graduates will achieve results by fostering collaboration, communication and adaptability on individual, team, and organization levels.</p>	5, 6	Participation
3.1 Motivate and work with colleagues, partners, and other stakeholders to achieve organizational purposes.	5, 6	Participation
3.2 Help build and sustain high-performing teams by infusing teams with a variety of perspectives, talents, and skills and aligning individual success with team success and with overall organizational success.	1, 2, 3, 4, 5	Participation
3.3 Foster collaboration, communication and adaptability in helping organizations excel in a changing business landscape.	1, 2, 3, 4, 5	Participation