

Actuarial Finance II

CRN: 25146

Spring 2023

Professor. Chia-Chun (Cici) Chiang

cchiang@utep.edu

Office: BUSN 247

(915) 747-7167

Class Hours: Tuesday/Thursday 9:00 – 10:20 am (BUSN 321)

Office Hours: Tuesday/Thursday 10:30 – 11:30 or by appointment

Course Information: What this class is about and what we will do

COURSE DESCRIPTION

This course is an introduction to the fundamental concepts and applications of financial mathematics. Topics include bond valuation, bond amortization, interest rate swap, investment yield, investment portfolio, duration, convexity, asset/liability management, and immunization strategies. Students enrolled in FIN 4341 should have successfully completed FIN 4340.

EXPECTED LEARNING OUTCOMES

At the end of this course, students will be able to:

- (1) Understand the basic valuation of a standard bond, and callable bond.
- (2) Perform calculations relating to duration (Macaulay and modified), convexity (Macaulay and modified), spot rate, forward rate and yield curve.
- (3) Construct an investment portfolio to:
 - Redington immunize a set of liability cash flows.
 - Fully immunize a set of liability cash flows.
 - Exactly match a set of liability cash flows.
- (4) Develop analytical problem-solving skills to solve complex problems from first principles rather than memorization.

HOMEWORK ASSIGNMENT SOFTWARE

Coaching Actuaries is an online software that allows students to submit homework assignments and check their work online. Access to Coaching Actuaries is required for this course.

GRADING AND HOMEWORK ASSIGNMENTS

Grade Distribution:

[100-90] = A (90, 80] = B (80-70] = C (70-60] = D < 59 = F

If you pass exam FM before the end of the semester, you will get an A.

Grade Components:

Exam 1,2,3 and final (19% points each)	76%
Homework & VBA Assignments	12%
In-Class Quizzes	12%
Total	100%

Exam 1, Exam 2, Exam 3 and Final:

- **All exams will be closed-book, and no formula sheet is allowed (and on all SOA exams as well!).** Suspicious behaviors may be reported to the Office of Student Conduct. All exams will be closed-book, and no formula sheet is allowed.
- Students are required to bring their own calculators (smartphones are not allowed). Students who miss an exam without a valid reason will receive a zero on that exam. Make-up exams will be allowed only with pre-approval of the instructor or with an acceptable, documented reason. Acceptable reasons for make-up exams include severe illness, family emergencies, or other unavoidable events, including dangerous weather conditions and car accidents. Exam format for make-up exams may be different from the original exam.

Homework Assignments:

The homework assignments aim to help you understand the theories covered in the class and to prepare you for the exams. You are allowed and encouraged to collaborate on these problems, although every student must submit their own answers. **Late homework is not accepted.** Please complete your assignments well in advance.

COURSE COMMUNICATION

- **Email:** UTEP e-mail is the best way to contact me. I will make every attempt to respond to your e-mail within 24-48 hours of receipt. When e-mailing me, be sure to email from your UTEP student account and please put the course number in the subject line. In the body of your e-mail, clearly state your question. At the end of your e-mail, be sure to put your first and last name, and your university identification number.
- **Announcements:** Check the Blackboard announcements frequently for any updates, deadlines, or other important messages.

ATTENDANCE AND PARTICIPATION

Although there is no attendance point for this class, students are strongly encouraged to attend

every class and participate in classroom discussions. Students who attend class regularly perform substantially better in the exams than those who do not.

EXCUSED ABSENCES AND/OR COURSE DROP POLICY

I will not drop you from the course. However, if you feel that you are unable to complete the course successfully, please contact the Registrar's Office to initiate the drop process. If you do not, you are at risk of receiving an "F" for the course.

ALTERNATIVE MEANS OF SUBMITTING WORK IN CASE OF TECHNICAL ISSUES

I strongly suggest that you submit your work with plenty of time to spare in the event that you have a technical issue with the course website, network, and/or your computer. I also suggest you save all your work in a separate Word document as a back-up. This way, you will have evidence that you completed the work and will not lose credit. If you are experiencing difficulties submitting your work through the course website, please contact the UTEP Help Desk. You can email me your back-up document as a last resort.

ACCOMMODATIONS POLICY

The University is committed to providing reasonable accommodations and auxiliary services to students, staff, faculty, job applicants, applicants for admissions, and other beneficiaries of University programs, services and activities with documented disabilities in order to provide them with equal opportunities to participate in programs, services, and activities in compliance with sections 503 and 504 of the Rehabilitation Act of 1973, as amended, and the Americans with Disabilities Act (ADA) of 1990 and the Americans with Disabilities Act Amendments Act (ADAAA) of 2008. Reasonable accommodations will be made unless it is determined that doing so would cause undue hardship on the University. Students requesting an accommodation based on a disability must register with the UTEP Center for Accommodations and Support Services (CASS). Contact the Center for Accommodations and Support Services at 915-747-5148, or email them at cass@utep.edu, or apply for accommodations online via the CASS portal.

SCHOLASTIC INTEGRITY

Academic dishonesty is prohibited and is considered a violation of the UTEP Handbook of Operating Procedures. It includes, but is not limited to, cheating, plagiarism, and collusion. Cheating may involve copying from or providing information to another student, possessing unauthorized materials during a test, or falsifying research data on laboratory reports. Plagiarism occurs when someone intentionally or knowingly represents the words or ideas of another as ones' own. Collusion involves collaborating with another person to commit any academically dishonest act. Any act of academic dishonesty attempted by a UTEP student is unacceptable and will not be tolerated. All suspected violations of academic integrity at The University of Texas at El Paso must be reported to the Office of Student Conduct and Conflict Resolution (OSCCR) for possible disciplinary action. To learn more, please visit HOOP: Student Conduct and Discipline.

COPYRIGHT STATEMENT FOR COURSE MATERIALS

All materials used in this course are protected by copyright law. The course materials are only for the use of students currently enrolled in this course and only for the purpose of this course. They may not be further disseminated.

COVID-19 PRECAUTIONS

You must **STAY AT HOME** and **REPORT** if you (1) have been diagnosed with COVID-19, (2) are experiencing COVID-19 symptoms, or (3) have had recent contact with a person who has received a positive coronavirus test. Reports should be made at screening.utep.edu. If you know of anyone who should report any of these three criteria, you should encourage them to report. If the individual cannot report, you can report on their behalf by sending an email to COVIDaction@utep.edu.

For each day that you attend campus—for any reason—you must complete the questions on the UTEP screening website (screening.utep.edu) prior to arriving on campus. The website will verify if you are permitted to come to campus. Under no circumstances should anyone come to class when feeling ill or exhibiting any of the known COVID-19 symptoms. If you are feeling unwell, please let me know as soon as possible, and alternative instruction will be provided. Students are advised to minimize the number of encounters with others to avoid infection.

Wear face coverings when in common areas of campus or when others are present. You must wear a face covering over your nose and mouth at all times in this class. If you choose not to wear a face covering, you may not enter the classroom. If you remove your face covering, you will be asked to put it on or leave the classroom. Students who refuse to wear a face covering and follow preventive COVID-19 guidelines will be dismissed from the class and will be subject to disciplinary action according to Section 1.2.3 *Health and Safety* and Section 1.2.2.5 *Disruptions* in the UTEP Handbook of Operating Procedures.

Course Resources:

UTEP provides a variety of student services and support:

Technology Resources

- **Help Desk:** Students experiencing technological challenges (email, Blackboard, software, etc.) can submit a ticket to the UTEP Helpdesk for assistance. Contact the Helpdesk via phone, email, chat, website, or in person if on campus.

Academic Resources

- **UTEP Library:** Access a wide range of resources including online, full-text access to thousands of journals and eBooks plus reference service and librarian assistance for enrolled students.
- **University Writing Center (UWC):** Submit papers here for assistance with writing style and formatting, ask a tutor for help and explore other writing resources.
- **Math Tutoring Center (MaRCS):** Ask a tutor for help and explore other available math resources.

- History Tutoring Center (HTC): Receive assistance with writing history papers, get help from a tutor and explore other history resources.
- RefWorks: A bibliographic citation tool; check out the RefWorks tutorial and Fact Sheet and Quick-Start Guide.

Individual Resources

- Military Student Success Center: Assists personnel in any branch of service to reach their educational goals.
- Center for Accommodations and Support Services: Assists students with ADA-related accommodations for coursework, housing, and internships.
- Counseling and Psychological Services: Provides a variety of counseling services including individual, couples, and group sessions as well as career and disability assessments.

Tentative Schedule and Outline (I reserve the right to revise it)

Week		Topic
1	1/17	Bond Basics and Pricing (4.1)
	1/19	Bond Basics and Pricing (4.1)
2	1/24	Bond Basics and Pricing (4.1)
	1/26	Premium and Discount (4.2)
3	1/31	Review 1
	2/2	Exam 1
4	2/7	Bond Amortization (4.3)
	2/9	Callable Bonds (4.4)
5	2/14	Callable Bonds (4.4)
	2/16	Spot and Forward Rates (5.1)
6	2/21	Spot and Forward Rates (5.1)
	2/23	Review 2
7	2/28	Exam 2
	3/2	Duration (5.2)
8	3/7	Duration (5.2)
	3/9	Duration (5.2)
9	3/14	Spring Break
	3/16	Spring Break
10	3/21	Convexity (5.3)
	3/23	Redington and Full Immunization (5.4)
11	3/28	Review 3
	3/30	Exam 3
12	4/4	Immunization by Exact Matching (5.4)
	4/6	FM SOA Sample Questions (1)
13	4/11	FM SOA Sample Questions (2)
	4/13	VBA
14	4/18	FM SOA Sample Questions (3)
	4/20	FM SOA Sample Questions (4)
15	4/25	FM SOA Sample Questions (5)
	4/27	FM SOA Sample Questions (6)
16	5/2	FM SOA Sample Questions (7)
	5/4	FM SOA Sample Questions (8)
17		Final Exam (May 9 Tuesday) 10:00 am – 12:45 pm