

Professor:

Dr. John Kensinger

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Office hours: Tuesday/Thursday 11:00 AM—noon in office

Also available in classroom after class (please remain in the classroom if you want to see me after class)

Texts and Readings:

1. Don M. Chance & Robert Brooks, *An Introduction To Derivatives And Risk Management* (10th Edition), Southwestern Cengage Learning (2014). Student Edition ISBN-13: 978-1305104969.
2. Cases and additional readings will be handed out in advance of class discussions. Some of them will be available from the web site.

Purpose of the Course

Topics to be covered in this course include the analysis of derivative securities, pricing of options and futures contracts, arbitrage, hedging, spreads, portfolio insurance, and the use of derivatives for financial risk management.

Overview of the Text (from the publisher's web site)

A market leader, this book is ideally designed for a course in options and/or futures, derivatives, and/or risk management at the advanced undergraduate or MBA level. Detailed but flexible coverage of options, futures, forwards, swaps, and risk management—as well as a solid introduction to pricing, trading, and strategy—allows instructors to selectively tailor inclusion of topics/chapters to fit the length of the course.

Disability Accommodation

The College of Business Administration complies with the Americans with Disabilities Act in making reasonable accommodation for qualified students with disability. If you have an established disability as defined in the Americans with Disabilities Act and would like to request accommodation, please see me as soon as possible, prior to January 30. My phone numbers and e-mail address are shown at the top of this syllabus.

Student Quorum

In order to offer some relief for students who may get caught in occasional traffic delays, we will wait up to 15 minutes to begin covering new material if fewer than 80% of the enrolled students are present. If we are delayed waiting for a quorum, we will spend the time reviewing questions students may have about prior material or problem sets. Regardless of the presence of a full quorum, however, we will not delay any longer

than 15 minutes. When enough students are present at the scheduled starting time, of course, we will begin coverage of new material immediately.

Student Investment Group (SIG):

The College of Business Administration has entered into an agreement that all students taking investment-related courses shall be strongly encouraged to participate in the Student Investment Group (SIG). The group manages an endowment to be used for future student scholarships. An article about the SIG from the *Denton Record Chronicle* (12/31/03, p.1A) is attached to this syllabus. Adequate participation is determined by the SIG membership and faculty advisors, and is reported to the faculty at the end of the semester. All students in investment-related courses have opportunities to participate in the SIG via meetings of the organization, investment analysis for the portfolio management committee, and via the web resources the SIG sponsors. Students who have satisfactory participation in the SIG will receive five (5) bonus points on the final examination (this is equivalent to half a letter grade increment on the grading scale for this exam). For the latest information about the SIG and its activities, see the website at orgs.unt.edu/sig

Grading

Course grades will be calculated using the following weights:

Course Grade	
30%	First Examination
30%	Second Examination
40%	Final Examination

All requirements, including regular class participation, must be met satisfactorily in order to complete the course.

The examinations will have two sections. One will consist of objective questions (such as short answer, true/false, or multiple choice), and the other will consist of essays. The goal of the essays will be to apply major concepts of finance to specific situations and draw valid conclusions. The point is not to show everything you know, but to use what is relevant for the case at hand. A very common error is to write things that don't bear on the case.

Makeup or re-scheduled exams will be allowed with valid medical justification, because of some other documented personal emergency, or by prior arrangement to accommodate some other unavoidable conflict. Routine makeup exams must be completed prior to the next class meeting (to schedule the makeup, contact the FIREL department office, 940-565-3050). In case of prolonged incapacitation that is documented, other arrangements will be tailored to fit the particular situation. A student who does not make up a missed examination or does not contact the instructor may be dropped for non-attendance.

Computers:

During classroom work we will use spreadsheet packages that are available for download at the course web site. Some problems on the problem sets will also use these packages. Problems on examinations will not require computer access.

Calculators:

You will need a financial calculator. For overall value per dollar in the current generation of calculators I suggest the Hewlett-Packard HP-17. At the lower end of the HP line, the HP-10 offers all necessary capabilities for this course at an affordable price. At the high end of the price range, the HP-19 offers the most advanced capabilities available in the calculator market. In addition, the HP-12C is still a good value, although not as advanced as the HP-10 or HP-17. (When ordering HP calculators, be sure you are getting the business version and not the science/engineering version). For the student with advanced mathematical or computer training, palm-top PC or digital assistant would be acceptable, but will not receive classroom support.

Students with tight budgets can manage with an inexpensive calculator such as the Texas Instruments (TI) BA-II Plus, which costs less than a textbook. There is a downside, however. The cheaper calculators lack the ability to deal with a series of unequal cash flows. Although you can manage this course without such capabilities, it is very likely that you will need to step up to a better calculator someday soon. Another word of caution is also in order: if you buy a used calculator be sure to get a complete instruction manual, otherwise you'll have a paperweight with great untapped potential.

Cell Phones:

Cell phones must be turned off and put away during examinations. Absolutely no text messaging or wireless email is allowed during examinations. Those leaving the examination room for any reason may not use cell phones and other wireless devices or discuss the exam with anyone while the examination is still under way.

Tips on Study Management

- Read all the appendices associated with assigned chapters.
- Familiarize yourself with assigned readings prior to the lectures. A good strategy would be to skim for a general grasp of the issues before the lecture, and then do your focused study afterwards. It is essential not to get behind, since the new topics build on past material.
- Problem sets are designed to stimulate class discussion and provide exercise in preparation for the examinations. They will not be graded in and of themselves. Give the problem sets your best shot before we discuss them in class, even though they will not be collected or graded. By all means, don't look at the solutions until you have given the problems your best shot.

Cases

We will definitely plan to do the first two cases. The remaining four will depend upon the progress we are making, and some of them may be skipped or abbreviated as

needed. The professor will advise at the class prior to the time when the cases are scheduled.

Overview of the Course Format

We will follow derivatives in the chronological order of their introduction into the marketplace (which is also the order of complexity). We'll follow a "Lego Approach" as we proceed from primary securities through the various levels of derivatives. We'll start with basic forward contracts, placing strong emphasis on how it is possible to substitute buying and storing the underlying asset (using borrowed money) in place of buying a forward contract. Once this equivalence is firmly established, the pricing of forward contracts becomes a straightforward application of the time value of money (using the riskless interest rate). Through problems and test questions, I strongly reinforce the idea that a synthetic forward contract can be readily created through buying and holding the underlying asset, using 100% debt financing.

Next we'll break forward contracts into puts and calls (the market history of this action can be traced back several centuries). The central valuation concept—that should be highlight with flashing neon lights—is put/call parity. One of the key things this relationship illustrates is that the equilibrium forward price (at which the forward contract is freely exchanged between buyers and sellers at no cost) would also be the exercise price at which the value of a call would exactly equal the value of a put with the same underlying asset and expiration. Through this relationship, it is easy to understand that puts and calls just represent separate parts of a forward contract, and their creation is a normal step in the process of making the market more complete.

Put/call parity also removes from the process of option pricing any need to find risk-adjusted interest rates. Further, all of the key relationships can be readily demonstrated through simple rearrangements of the put/call parity equation. Likewise, all of the arbitrage strategies can be reduced to finding momentary violations of put/call parity.

We'll then move to option pricing models. I do a short example of binomial modelling in order to set up the intuition, but don't emphasize binomial approaches heavily because they are a rudimentary approximation of reality. We quickly move to the core idea of the Black-Scholes Model, that synthetic options can be created from the underlying asset and debt. For such substitutions to work, price changes must come in a series of small moves, with no sharp jumps (hence the assumption of Brownian Motion, even though we now realize it is not always an accurate description). We use an option calculator spreadsheet (available for download at www.coba.unt.edu/firel/kensing) to work with the "greeks" and the various hedging strategies (delta, gamma, and vega hedging).

We use the Leland-O'Brien-Rubinstein portfolio insurance case to see how portfolio insurance is supposed to work (using synthetics or index futures), and what went wrong with portfolio insurance during the stock market crash of 1987. We then

consider the advantages of looking for equilibrium option premia within a band of acceptable prices, rather than along a precise line.

Next, we consider breaking puts or calls into smaller chunks—hence the all-or-nothing options. This also serves as a foundation for advanced interest rate risk management products such as caplets.

Having followed the process of grinding contracts into ever smaller chunks through to its current conclusion, we go back to fill in some of the blanks. The main emphasis at this point is to establish the advantages swaps offer in comparison with forward or futures contracts. We consider all of the various swap configurations, along with the advantages and risks for the various parties.

If there is still time, we conclude the course with a short consideration of potential role for derivatives in the broader purposes of Enterprise Risk Management. Often, though, this topic must be sacrificed in the interests of time.

Class Schedule

January 19: Overview: Variety of Derivatives and Their Uses

Key Concept: Volatility is a commodity

January 21: Topic 1: Derivatives Markets

Chapter:	Chapter Title:
1	Introduction
2	The Structure of Derivatives Markets
	See appendices for information on margin requirements & taxation of option transactions
8	Principals of Pricing Forwards, Futures and Options on Futures
	See appendices for information on financial futures contract specifications & taxation of futures transactions

Handouts:

- Donald J. Smith, “The Arithmetic of Financial Engineering,” *Journal of Applied Corporate Finance* vol.1 (no. 4, 1989), pp. 49-58.
- Charles W. Smithson, “A LEGO Approach to Financial Engineering: An Introduction to Forwards, Futures, Swaps, and Options,” *Midland Corporate Finance Journal* vol.4 (no.4, 1987), pp. 16-28.

January 26 & 28: Topic 2: Forward and Futures Contracting

Chapter:	Chapter Title:
9	Futures Arbitrage Strategies
	See appendices for information on deriving the hedge ratio & taxation of hedging transactions

February 2: Problem Set 1: Equilibrium in Futures Markets

February 4: Topic 3: Advanced Futures Strategies

Chapter:	Chapter Title:
10	Forward & Futures Hedging, Spread, and Target Strategies
	See appendices for information on determining the CBOT Treasury Bond Conversion Factor and deriving the hedge ratio for adjusting duration with treasury bond futures

February 9: Problem Set 2: Advanced Futures Strategies

February 11: Topic 4: Option Pricing

Chapter:	Chapter Title:
3	Principles of Option Pricing
4	Option Pricing Models: The Binomial Model
5	Option Pricing Models: The Black-Scholes-Merton Model
	See appendices for information about calculating implied volatility, and about using the BSBWIN2.1 Windows Software (this Windows software is recommended, but not required)

February 16: Topic 4 continued

February 18: Problem Set 3: Option Valuation and Arbitrage Strategies

February 23: Problem Set 4: Options on Futures

Please download the “Options Calculator” from the course web site. This software is required for some of the problems sets.

February 25: Topic 5: Option Strategies

Chapter:	Chapter Title:
6	Basic Option Strategies
7	Advanced Option Strategies

March 1: Topic 6: The Arithmetic of Financial Engineering

March 3: Problem Set 5: The Arithmetic of Financial Engineering

March 8: Case 1: “Shearson Lehman Hutton, Inc. (A): Entry into the Covered Warrant Business” (handout)

Case 2: “Goldman, Sachs, & Co: Nikkei Put Warrants” (handout)

March 10: FIRST EXAMINATION

March 15 & 17: SPRING BREAK
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March 22: Review Exams

March 24: Topic 7: Forward Rate Agreements & Interest Rate Options

Chapter:	Chapter Title:
11	Swaps
	See appendix for information on contract specifications
12	Interest Rate Forwards & Options
	See appendix for information about the Ho-Lee Model of the Term Structure

March 29: Topic 7 continued

March 31: Problem Set 6: Swaps & IRRMs

April 5: Case 3: “American Barrick Resources Corporation” (handout)

Case 4: “Enron Gas Services” (handout)

April 7: Topic 8: Portfolio Insurance & Other Advanced Derivatives Strategies

Chapter:	Chapter Title:
13	Advanced Derivatives and Strategies
	See appendix for information about deriving the dynamic hedge ratio for portfolio insurance

April 12: Problem Set 7: Portfolio Insurance

April 14: Case 5: “Leland O’Brien Rubinstein Associates Inc: Portfolio Insurance” (handout)

April 19 & 21: Topic 9: Market Risk Management

Chapter:	Chapter Title:
14	Financial Risk Management Techniques & Applications

April 26: Topic 10: Enterprise Risk Management

Chapter:	Chapter Title:
15	Managing Risk in an Organization

Case 6: “An Investment Linked to Commodity Futures” (handout)

Course review

April 28: Second EXAMINATION

May 3: Review Exams

May 5: Course Review

CUMULATIVE FINAL EXAMINATION, Thursday May 12, 8:00-10:00 AM

Required Addendum

Student Perceptions of Teaching (SPOT)

Student feedback is important and an essential part of participation in this course. The student evaluation of instruction is a requirement for all organized classes at UNT. The short SPOT survey will be made available **April 18th – May 1st** to provide you with an opportunity to evaluate how this course is taught. For the spring 2016 semester you will receive an email on **April 18th (12:01 a.m.)** from "UNT SPOT Course Evaluations via *IASystem* Notification" (no-reply@iasystem.org) with the survey link. Please look for the email in your UNT email inbox. Simply click on the link and complete your survey. Once you complete the survey you will receive a confirmation email that the survey has been submitted. For additional information, please visit the spot website at www.spot.unt.edu or email spot@unt.edu.