Overview:

Over 30 years ago Black and Scholes developed an option pricing formulae and a valuation mechanism that was to change the development of modern finance. Then, derivatives were considered an esoteric and specialized subject. Today, basic knowledge of derivatives is essential to understand modern finance. Corporations routine hedge and insure against risks including exchange risk, interest rate risk, commodity price risk, market risks, credit risks, poor weather, etc. A basic understanding of how this is accomplished is essential. Further, derivative models are not only used to value structured products, and to establish risk management strategies. The array of options and futures, as well as other derivative securities is unbelievably large. An understanding of these products is essential for almost anyone interested in any aspect of corporate finance, even if the area excludes investments. For example, if your interests are in mergers and acquisitions, international business or international finance, then an understanding of the valuation issues associated with derivatives is essential.

Markets for futures, options and options on futures have mushroomed over the last two decades, and new products continue to be introduced. Markets in Europe and Asia are growing rapidly as well. Indeed, over the last decade the volume of derivative trading has grown at an annual rate of about 30%. Over-the-counter markets have experienced even more dramatic growth. Such contracts are tailor designed by brokerage firms and investment banks to meet the very specific needs of their corporate clients.

In BAFI 430 you will study the basics of derivative products including forwards, futures, options and swaps. You will learn how to use these markets in an intelligent way. Hedging and insuring applications will be covered in some detail. Valuation, with many applications, both in the investments arena, and in corporate finance will be emphasized.

Derivatives is often viewed as an analytical subject, but throughout this class we will emphasize intuition and application, and we will have many examples and case studies that will make the fundamental ideas crystal clear.
After taking this class you will be able to:

- Communicate the risk management needs faced by the firm and to isolate the steps needed to solve the problem.
- Explain the why certain products and strategies create value while others do not.
- Distinguish when hedging is appropriate.
- Price contracts and prevent being ripped off.
- Be able to use option models in valuing real assets.

**Mid Term Exam Date:** March 9th  
**Final Exam Date:** May 4th

**Grading:**

Your grade for this course will be based on your performance in two exams, on the group projects and on the homework assignments. Please note that the final exam is not cumulative and it will cover only the material discussed after the mid-term exam. You are allowed to bring your calculators and one sheet of formulas to the exams. The weights for the different components in your overall grade are as follows:

- **Mid-term Exam:** 35%
- **Final Exam:** 35%
- **Case Projects:** 15%
- **Individual Reports:** 5%
- **Homework (3):** 10%

I will give partial credit for partially correct answers in your homeworks and exams. My grading of your project reports will be relative in nature and, to some extent, subjective. This is unavoidable given the nature of class projects. Of course, I will provide extensive comments on various aspects of your reports so that you can better understand the reasons for your grade. Your overall course grade will also be based on relative grading where the mid-point of the B-grade distribution will be at or near the overall mean/median class score. Students who score “significantly” above (below) the mean/median can expect to receive A (C or lower) grades. Please note that I do not use any automatic cutoff levels for any grade. This ambiguity is deliberate in order to make the grading truly relative and also to discourage student obsession with scores (I want you to focus more on understanding the material).

**Homework:**

Finance, by its very nature, is a quantitative subject and this course is no exception. Problem-solving is also a powerful tool in reinforcing your understanding of the economic concepts we will deal with in class. Therefore, it is absolutely essential that you
should solve the end-of-chapter textbook problems in Hull and the assignment problems that are due to be turned in. Homework must be turned in at the beginning of class. These problem sets must be solved individually and must reflect your own work. Absolutely no extensions are provided.

Since more than 50% of your exams will comprise of problems that are similar in style and difficulty to the homework problems and end-of-chapter exercises, please devote ample time to developing your problem-solving skills and talk to me as often as you need to resolve your difficulties. Generally, homework will be assigned each week. All homework assignments carry equal weight. Your lowest grade on a homework will be discarded. Full solutions will be provided to the homework problems and posted in Blackboard. I would appreciate it if you did not e-mail me your homework since I am always virus weary, and probably will fail to print it out and put it with the rest of the classes assignments.

Homework problems may come from Hull or from the end of the chapters of my course notes. The HW will be assigned at the end of each class.

Cases

We will study three or four cases depending on time. Students must establish a team for the semester. Each team can have up to 5 members. You should submit the names of all members in your team to me before the end of February.

Each member of your team should read the case carefully, and then discuss it with the other members of the group before tackling the questions. Each group must submit a case report with answers to these questions. The case report must be typed, double-spaced and no more than 6-7 pages long (with any supporting exhibits, etc.). Please provide your reasoning and all relevant supporting information from the case and elsewhere when answering these questions. Remember that I am not looking for one “right” answer but rather I am interested in seeing how you think about and reason out the issues. The case will then be discussed in class.

Report

Each person is required to turn in a report on some problem involving risk management and the use (or abuse) of derivatives. The goal of the project is to get you to do a bit of independent reading beyond The Wall Street Journal. Risk Magazine is an excellent source for ideas on this report as are the many excellent risk portals on the web, and the educational sites at all the major Options and Futures exchanges. These sites may provide you with ideas for a report. The report will be due in one week before the final exam. My expectation for a deliverable project is somewhere between 5-10 pages, with Appendices containing the sources of information. Typical projects include studies on some of the large mishaps using derivatives, some of the innovative financial engineering solutions to specific risk management problems. I will discuss possible topics throughout the course. Since this report only counts for 5% of your grade you have the option not to do this. For those students in between grades, the report can make a difference to your final grade.
Examples of papers that students have used in the past for the basis of their reports include:

- “On the Determinants of Corporate Hedging” by Nance, Smith and Smithson, *Journal of Finance*
- “Half a billion Gibson plays it dumb” *Euromoney*
- “Theory versus Practice: Does financial risk management increase shareholder value?” Smithson, *Risk Magazine*
- “Flexibility or Hedging?” Mello, Parsons, Triantis, *Risk Magazine*

I would encourage you to browse through recent editions of RISK magazine, and the Journal of Derivatives for ideas. There are some excellent free educational programs and some great software tools that you can download. I will indicate some of the ones that I have found to be useful. If you find some great sites, please let me know.

**Class Participation:**

I strongly encourage you to participate in the classroom discussions. I want all of you to feel free to stop me at any time during my lecture to ask a question or seek a clarification. If I make a point that you disagree with, do not hesitate to challenge me. I believe that such give-and-take can enliven the lecture and bring up different perspectives of looking at an issue and it can also lead to a discussion of interesting supplementary issues. In order for all of us to get to know each other, please use nameplates in class.

**Office Hours**

I have office hours on Thursday **afternoons, 3.45 –5.45pm**. If you cannot see me during the scheduled window, you need to make an **appointment**. For part time students, perhaps you can call me in my office during office hours and I can respond to your questions on the phone or we can set up an appointment. If you have **urgent** questions then e-mail me.
Textbooks:


- Hull has two very popular textbooks. The second book is called *Options, Futures and Other Derivatives,* and is now in sixth edition. This latter book is more technical than the book we are using and covers many more topics than can be covered in a semester. If you are ever interviewed and asked at what level did you have a derivatives class, then answering at the Hull level, will immediately signal that you have had a well structured class and that you should understand the fundamentals of these products, the fundamentals of valuation, and the fundamentals of risk management.

*Derivative Markets,* by Peter Ritchken.

- This is an electronic textbook available from my website. Please make sure that you get the password that will enable you to download the text.

- I also have powerpoint class notes which you are welcome to download from my web site.

- You can also review material on video that I have had taped.

- I will NOT distribute hard copies of the course notes in class. **Please make sure you bring the class overheads to class.** I MAY follow the overheads, but typically I deviate from them depending on the dialogue in the class.

- You should read the *Wall Street Journal.* In particular read the Options and Futures pages of Money and Investing Section and try and make sense of what the reports say.

**Recommended Study**

I recommend that you read the chapter (from Hull) we are going to cover before coming to class. If you have time then read my course notes as well. This will increase your understanding of the class material. A final reading after class should reinforce the concepts. Over time you probably will either gravitate to Hull or to my notes as a first source, depending on your learning style/preferences. From time to time I may direct you to certain videos that will act as reviews of important topics. At the end of each class I will indicate the readings for the next class. This may deviate slightly from the course syllabus.

I also recommend that you solve as many problems as you can. The Homework assignments are really the **minimum** set of problems that you should attempt.
Those of you who desire to pursue a career in the financial industry may want references to other advanced textbooks and journal articles. I will be happy to advise you on such references and discuss additional material with you. Feel free to drop by my office.

**Academic Integrity:**

All students in this course are expected to adhere to university standards of academic integrity. Cheating, plagiarism, and other forms of academic dishonesty will not be tolerated in this course. This includes, but is not limited to, consulting with another person during an exam, turning in written work that was prepared by someone other than you, and making minor modifications to the work of someone else and turning it in as your own. Ignorance will not be permitted as an excuse. If you are not sure whether something you plan to submit would be considered either cheating or plagiarism, it is your responsibility to ask for clarification. Either ask me about it or consult credible sources of information on the subject. Two useful internet sites are

http://www.indiana.edu/~wts/pamphlets/plagiarism.shtml

Please remember that you have agreed to Standards Regarding Academic Integrity (a copy of which can be found at http://weatherhead.case.edu/pdpao/policy/policyhome.html) which outlines your responsibility in greater detail.
A Tentative Course Outline

Below is a tentative course outline. We may adjust it from time to time depending on how the class proceeds. For example, we might focus in on certain topics in more detail. The risk management function will be emphasized throughout. Less attention will be placed on the actual market structures and operations of exchanges. I will assume that you have done all the readings that I assign, ahead of schedule.

Lecture 1:
An Overview of the Class.

Why is risk management important?
Why do firms hedge?
Increased uncertainty (volatility) in markets.
The wide variety of products.
Why are more products better than fewer products?
Measuring a firm's exposure to financial price risk
   To what degree is my firm exposed to interest rates, FOREX, commodity prices?
Examples
Financial Engineering and Structured products

Readings: None

Lecture 2
Forward and Futures Markets
Payoff diagrams
Long Positions and Short Positions
Forward contracts
Credit risk
Futures Contracts
Clearing Houses
Marking to Market
Hedging Strategies with Forwards and Futures

Readings Hull Chapter 2, Ritchken Chapter 1.

Lecture 3
Call and Put Options
Definitions
Payout diagrams
Long and short positions
Options as insurance
Examples
Some simple pricing relationships

Readings: Hull Chapter 8, Ritchken Chapter 4

Lecture 3 and 4
Option Strategies.
Hedging with Options
The Wide Variety of Option strategies.
Spreads, Collars, Straddles, Strangles and more.
Equity Linked Notes.

Readings: Hull Chapter 10, Ritchken Chapter 5
Lecture 5
Pricing Forwards and Futures
Valuing Futures contracts.
The relationship between forward and futures prices
Pricing forward contracts.
Arbitrage relationships.
The term structure of futures prices and basis risk.
Swaps

Reading: Hull, Chapter 5, Ritchken, Chapter 2.

Lecture 6
Basic Hedging Strategies Using Futures
Hedging using Forwards and Futures
Basis risk
Long and Short Hedges.
Risk Minimizing Hedges.
Issues in Hedging.

Case Study: Mettalgesellschaft
What went wrong in the hedging program at MG?

Readings: Hull, Chapter 3; Ritchken Chapter 3;
Prepare Mini-Case on MG.

Lecture 7:
Basic Hedging Strategies Using Options
Protection in equity markets
Protection in commodity markets
Portfolio insurance

Putting it all together:
Case Study: Svenska Neuhaus
This case looks at how a firm could hedge using options and/or futures and/or forwards involving exchanges in multiple countries. After looking at a bunch of alternatives you have to recommend the best hedging strategy for the firm.

Readings: Prepare Case

Lecture 8
Option Arbitrage Relationships, and Stochastic Modeling of Asset Prices.
Pricing Bounds
Put Call Parity
Evolution of Uncertainty.
The Geometric Wiener Process
Confidence Intervals of Prices over time.
Computer Simulations in Excel.
Simulating Option Prices
How to price Exotics

Readings: Parts of Chapter 10 of Hull; Parts of Chapter 6 and 7 of Ritchken
Lecture 9
Option Pricing Models
The Binomial Option Pricing Model.
The Black Scholes Model

Readings: Hull, Chapter 11 and 12;
Ritchken Chapters 8 and 9.

Lecture 10
Pricing Options on Futures, Stock Indices, Foreign Currencies
Impact of Dividends
Merton’s Model
Examples on lattices
Risk Management of optioned positions

Readings: Hull: Chapter 13 and 14.

Lecture 11
Case Study: Sally Jameson
This case looks at executive stock options and attempts to value them, look at alternatives, and assess whether these contracts are good for the shareholders of the firm.

Prepare Case

Lecture 11/12:
Risk Management with Options
The Greeks
Managing Non linear Risk
Identifying Toxic Waste!

Readings: Hull, Chapter 15; Ritchken, Chapter 10.

Lecture 13:
American Barrick Resources Corporation: Managing Gold Price Risk
This case illustrates the diversity of risk management practices in the gold mining industry and allows you to relate theoretical rationales for risk management to the arguments given by practitioners. You will see the contracts and techniques firms use to manage commodity risk.

Readings: Prepare Case

Lecture 13/14
Real Options
Capital Budgeting and Real Options
Corporate Securities as Options
Pricing Flexibility.

Case Study: Arundel Partners: The sequel project.
This project looks at a partnership that think they can make money buying movie sequel rights. The case provides a good example of an alternative approach to NPV. In particular we use option valuation to value these rights.

Readings: Prepare Case

Time Permitting:
Case Studies in the Use of Derivatives
Insurance, Weather and Energy Derivatives
Derivatives Mishaps and what we learn from them.