

## FIN 6537 Derivative Securities

**Course Objective:** On Wall Street, individuals who are skilled at analyzing derivatives are in great demand and command very high salaries. The objective of this course is for student to (a) understand the characteristics of various derivatives, (b) take a look at the “black box” so as to understand the pros and cons of various models that are widely used, and (c) gain some experience in applying these instruments and models for valuation, risk management and financial engineering.

**Course Description:** The course will deal with (a) the structure and operation of derivative markets (options, forward contracts, futures, swaps and other derivatives), (b) the valuation of derivatives, (c) the hedging of derivatives, and (d) applications of derivatives in the area of risk management, portfolio insurance, and financial engineering. The models that will be studied include the Black-Scholes model, binomial trees, and Monte-Carlo simulation. Specific topics include simple no-arbitrage pricing relations for futures/forward contracts and the put-call parity relationship; delta, gamma and vega hedging; implied standard deviation and its statistical properties; portfolio insurance; and dynamic replication strategies.

By its very nature a course like this involves some advanced mathematics and statistics. However, in this course the math will be kept to the minimum that is required (the higher level math will be relegated to Appendices and will be optional).

This course will use both the lecture and the case method of instruction. The lectures, supplemented by notes, examples and assignments are intended to familiarize students with the basic concepts, quantitative techniques, pricing, and institutional details necessary for making decisions involving derivatives. Careful quantitative analysis is essential, but not sufficient, for decision making in a multi-faceted and changing business environment. This is where the cases come in. They not only require the application of basic concepts and quantitative skills, but also require consideration of the competitive environment, the myriad of alternative securities that may be available to the decision-maker, and other management and marketing issues. The cases will be used to illustrate the application of derivatives for portfolio insurance and financial engineering.

**Prerequisite:** (1) A core course in finance and preferably an investment course as well as a course in basic statistics and probability theory. (2) Good knowledge of basic finance concepts, including risk, return, arbitrage, efficient markets, and the time value of money. (3) Working knowledge of EXCEL. FIN 5437 & FIN 5439 or FIN 6930 Corporate Finance.

**Textbook:** (1) *Fundamentals of Futures and Options Markets* (6<sup>th</sup> Edition) by John C. Hull, Prentice Hall. (With software for derivative pricing) (2) Lecture notes (overheads) and cases available at Target Copy Center. (3) Computer spreadsheets (Excel) discussed in class will be made available on the class website.

**Assignment:** All assignments should be treated as equivalent to take-home exams. The reports for these should be typed. Late reports will not be accepted. The assignments are (1) Two Problem Sets – consists of several end-of-chapter problems. (2) Two Cases – Students will be required to work in groups of four or five to complete the cases. (3) Computer Assignments – Students will be required to work in groups of four or five to complete the computer assignment involving Monte Carlo simulation and option valuation using EXCEL.

**Grading:** Problem Sets (20%, 10% each); Computer Assignment (20%); Case Assignment (10%, 5% each); Class Participation and Attendance (10%); Final Exam (40%)