

# **FIN6360 Options and Futures Markets**

**Summer 2016**

**Instructor:** Dr. Kaisheng Song

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**eLearning:** class announcements, homework assignments, class notes/handouts, the updated syllabus and other reading materials will all be posted on eLearning.

**Office Hours:** Monday: 5:00pm-6:00pm.

**TA:** Mr. Amir Zemooodeh

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**Office Hours:** TBA

## **Course Description:**

This course covers a broad range of topics in financial derivatives and risk management. These topics include pricing, hedging and trading strategies of widely-used financial derivatives such as forwards, futures, swaps, and options, and various risk measures for the portfolio of derivatives. Derivatives have become increasingly important in financial markets as evidenced by their extraordinary growth and use over the past several decades by financial institutions and firms for managing the varied risks of their assets and liabilities. The focus of this course is not only on the mechanics and analytics of financial derivatives, but also on their underlying economics principles such as the argument of no-arbitrage pricing and risk-neutral valuation. We also examine the assumptions and limitations underlying these financial models and develop a basic understanding of when to use and when not to use some of these financial models in risk management. Although an applied approach dominates the course, each topic will be explored with a theoretical exposition. In-depth discussions of the fundamental concepts and theoretical reasoning are provided through various examples. To develop quantitative skills in the analysis of financial derivatives and risk management, we solve a wide range of problems throughout the course.

## **Student Learning Objectives/Outcomes:**

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

- be familiar with most of the financial derivatives products they are likely to encounter in financial markets
- have a good knowledge of how the basic types of derivative instruments work and how they are used in financial markets and how financial institutions and firms hedge their risks when they trade these financial derivatives products
- master the fundamentals of derivative pricing such as pricing forwards and futures
- value interest rate swaps and fixed-for-fixed currency swaps
- grasp the mechanics of options markets
- master the properties of options such as put-call parity.
- develop competencies in options trading strategies such as spreads and combinations
- understand the no-arbitrage arguments and the principle of risk-neutral valuation
- construct one-step and two-step binomial trees for pricing options
- have a good understanding of the Black-Scholes-Merton model, its assumptions and pricing formulas
- know the Greek letters and understand the volatility smiles and implied risk-neutral distributions
- grasp the value-at-risk measure and know how to compute VaR and Credit VaR
- understand default intensity and estimate default probabilities by various approaches including bond yield spreads and Merton's model

**Prerequisite:** FIN 6306

**Required Text:**

*Options, Futures, and Other Derivatives* by John C. Hull, Pearson Education, Inc., 9th edition, 2015.

**Recommended Readings**

*An Introduction to Derivative Securities, Financial Markets, and Risk Management* by Robert A. Jarrow and Arkadev Chatterjea, W W Norton & Company, 2013

*When Genius Failed: The Rise and Fall of Long-Term Capital Management* by Roger Lowenstein, Random House, 2000.

*Inventing Money: The Story of Long-Term Capital Management and the Legends Behind It* by Nicholas Dunbar, John Wiley & Sons, 2000.

*The Wall Street Journal. Financial Times.*

**Class Times:** Monday: 6:00 p.m.-10:00 p.m.

**Class Location:** JSOM 2.717

### **Tentative Class Schedule**

Date	Topics	Readings
May 23	Course Overview: Options, Forwards & Futures Markets	Chapters 1 & 2
June 6	Hedging with Futures, Interest Rates	Chapters 3 & 4
June 13	Pricing Forwards and Futures, Interest Rate Futures	Chapters 5 & 6
June 20	Swaps, Mechanics of Options Markets & Trading	Chapters 7 & 10
June 27	MidTerm, Stock Options, Options Trading Strategies	Chapters 11 & 12
July 11	Binomial Trees, Brownian Motion	Chapter 13 & 14
July 18	Black-Scholes-Merton Model, Employee Stock Options	Chapters 15 & 16
July 25	Options on Stock Indices, Currencies & Futures	Chapters 17 & 18
August 1	Greek Letters, Volatility Smiles	Chapters 19 & 20
August 8	Value at Risk, Credit Risk & Final Review	Chapters 22, 24 & 36
August 10	Final Exam	

### **Grading Policies:**

The final course grade will be based on regular homework, a project, midterm and final exams, and class participation. The weights are as follows:

Homework	25%
Project	15%
Midterm Exam	25%
Final Exam	30%
Class Participation	5%

Based on the aforementioned weighted average, the final letter grades will be assigned as follows: A (90-100), B (80-89), C (70-79), D (60-69), F (59 or below). In addition, plus/minus grades (e.g.,  $A^+$ ) will be considered on an individual basis.

**Homework Policies:** Homework will be assigned weekly and they require independent work. Late homework assignments will NOT be accepted (two of your lowest homework scores will be dropped). **Please plan accordingly!**

**Attendance:** expected

**Exam Policies:**

- All exams are closed-book and closed-notes in-class exams. However, you are allowed to have a one-page (letter size, double-sided) formula sheet for each exam. **No make-up exams will be given.** If you have a University-excused/authorized absence, you must notify me **BEFORE** the exam. Such students must provide official written verification of such an absence. Students missing an exam for unauthorized reasons will receive 0 (zero) points on the exam.
- Calculators will be needed for the exams. It should be a "scientific" calculator with  $x^y$  and log functions, but nothing fancier than that is required.

**No Extra Credit or Assignment** to improve your grade.

### Student Conduct & Discipline

The University of Texas System and The University of Texas at Dallas have rules and regulations for the orderly and efficient conduct of their business. It is the responsibility of each student and each student organization to be knowledgeable about the rules and regulations which govern student conduct and activities. The University of Texas at Dallas administers student discipline within the procedures of recognized and established due process. Procedures are defined and described in the Rules and Regulations of the Board of Regents of the University of Texas System, Part 1, Chapter VI, Section 3, and in Title V, Rules on Student Services and Activities of the Course Syllabus Page 8, University Handbook of Operating Procedures. Copies of these rules and regulations are available to students in the Office of the Dean of Students, where staff members are available to assist students in interpreting the rules and regulations (SSB 4.400, 972/883- 6391). A student at the university neither loses the rights nor escapes the responsibilities of citizenship. He or she is expected to obey federal, state, and local laws as well as the Regents Rules, university regulations, and administrative rules.

Students are subject to discipline for violating the standards of conduct whether such conduct takes place on or off campus, or whether civil or criminal penalties are also imposed for such conduct.

#### Academic Integrity

The faculty and administration of the School of Management expect from our students a high level of responsibility and academic honesty. Because the value of an academic degree depends upon the absolute integrity of the work done by the student for that degree, it is imperative that a student demonstrate a high standard of individual honor in his or her scholastic work. We want to establish a reputation for the honorable behavior of our graduates, which extends throughout their careers. Both your individual reputation and the schools reputation matter to your success. The Judicial Affairs website lists examples of academic dishonesty. Dishonesty includes, but is not limited to cheating, plagiarism, collusion, facilitating academic dishonesty, fabrication, failure to contribute to a collaborative project and sabotage. Some of the ways students may engage in academic dishonesty are:

- Coughing and/or using visual or auditory signals in a test;
- Concealing notes on hands, caps, shoes, in pockets or the back of beverage bottle labels;
- Writing in blue books prior to an examination;
- Writing information on blackboards, desks, or keeping notes on the floor;
- Obtaining copies of an exam in advance;
- Passing information from an earlier class to a later class;
- Leaving information in the bathroom;
- Exchanging exams so that neighbors have identical test forms;
- Having a substitute take a test and providing falsified identification for the substitute;
- Fabricating data for lab assignments;
- Changing a graded paper and requesting that it be regraded;

- Failing to turn in a test or assignment and later suggesting the faculty member lost the item;
- Stealing another students graded test and affixing ones own name on it;
- Recording two answers, one on the test form, one on the answer sheet;
- Marking an answer sheet to enable another to see the answer;
- Encircling two adjacent answers and claiming to have had the correct answer;
- Stealing an exam for someone in another section or for placement in a test file;
- Using an electronic device to store test information, or to send or receive answers for a test;
- Destroying or removing library materials to gain an academic advantage;
- Consulting assignment solutions posted on websites of previous course offerings;
- Transferring a computer file from one persons account to another;
- Transmitting posted answers for an exam to a student in a testing area via electronic device;
- Downloading text from the Internet or other sources without proper attribution;
- Citing to false references or findings in research or other academic exercises;
- Unauthorized collaborating with another person in preparing academic exercises.
- Submitting a substantial portion of the same academic work more than once without written authorization from the instructor.

<http://www.utdallas.edu/judicialaffairs/UTDJudicialAffairsBasicexamples.html>

Updated: August, 2011

Plagiarism on written assignments, especially from the web, from portions of papers for other classes, and from any other source is unacceptable. On written assignments, this course will use the resources of turnitin.com, which searches the web for plagiarized content and is over 90% effective.

During tests and quizzes, students in this section are not allowed to have with them any food or drinks, scratch paper, course materials, textbooks, notes, invisible ink pens, or electronic devices, including iPads, iPhones, iPods, MP3 Players, earphones, radios, smart phones, cameras, calculators, multi-function timepieces, or computers. When possible, students should sit in alternating seats, face forward at all times, and remove any clothing which might conceal eye movements, reflect images of another's work, or hide course material for copying. Exam proctors will monitor any communication or signaling between students by talking, whispering, or making sounds, or by using your hands, feet, other body movements, the test paper itself or your writing implement. Students in this course suspected of academic dishonesty are subject to disciplinary proceedings, and if found responsible, the following minimum sanctions will be applied:

1. Homework – Zero for the Assignment
2. Case Write-ups – Zero for the Assignment
3. Quizzes – Zero for the Quiz
4. Presentations – Zero for the Assignment
5. Group Work – Zero for the Assignment for all group members
6. Tests – F for the course

These sanctions will be administered only after a student has been found officially responsible for academic dishonesty, either through waiving their right for a disciplinary hearing, or being declared responsible after a hearing administered by Judicial Affairs and the Dean of Students Office.

In the event that the student receives a failing grade for the course for academic dishonesty, the student is not allowed to withdraw as a way of preventing the grade from being entered on their record. Where a student receives an F in a course and chooses to take the course over to improve their grade, the original grade of F remains on their transcript, but does not count towards calculation of their GPA.

The School of Management also reserves the right to review a student's disciplinary record, on file with the Dean of Students, as one of the criteria for

determining a student's eligibility for a scholarship.

### Judicial Affairs Procedures

Under authority delegated by the Dean of Students, a faculty member who has reason to suspect that a student has engaged in academic dishonesty may conduct a conference with the student in compliance with the following procedures:

- (i) the student will be informed that he/she is believed to have committed an act or acts of academic dishonesty in violation of University rules;
- (ii) the student will be presented with any information in the knowledge or possession of the instructor which tends to support the allegation(s) of academic dishonesty;
- (iii) the student will be given an opportunity to present information on his/her behalf;
- (iv) after meeting with the student, the faculty member may choose not to refer the allegation if he/she determines that the allegations are not supported by the evidence; or
- (v) after meeting with the student, the faculty member may refer the allegations to the dean of students along with a referral form and all supporting documentation of the alleged violation. Under separate cover, the faculty member should forward the appropriate grade to be assessed if a student is found to be responsible for academic dishonesty;
- (vi) the faculty member may consult with the dean of students in determining the recommended grade;
- (vii) the faculty member must not impose any independent sanctions upon the student in lieu of a referral to Judicial Affairs;
- (viii) the faculty member may not impose a sanction of suspension or expulsion, but may make this recommendation in the referral documentation

If the faculty member chooses not to meet with the student and instead forwards the appropriate documentation directly to the dean of students, they should attempt to inform the student of the allegation and notify the student that the information has been forwarded to the Office of Dean of Students for investigation.

The student, pending a hearing, remains responsible for all academic exercises and syllabus requirements. The student may remain in class if the student's presence in the class does not interfere with the professor's ability to teach the



class or the ability of other class members to learn. (See Section 49.07, page V-49-4 for information regarding the removal of a student from class). Upon receipt of the referral form, class syllabus, and the supporting material/documentation from the faculty member, the dean shall proceed under the guidelines in the Handbook of Operating Procedures, Chapter 49, Subchapter C. If the respondent disputes the facts upon which the allegations are based, a fair and impartial disciplinary committee comprised of UTD faculty and students, shall hold a hearing and determine the responsibility of the student. If they find the student in violation of the code of conduct, the dean will then affirm the minimum sanction as provided in the syllabus, and share this information with the student. The dean will review the students prior disciplinary record and assess additional sanctions where appropriate to the circumstances. The dean will inform the student and the faculty member of their decision.

#### Copyright Notice

The copyright law of the United States (Title 17, United States Code) governs the making of photocopies or other reproductions of copyrighted materials, including music and software. Copying, displaying, reproducing, or distributing copyrighted works may infringe the copyright owners rights and such infringement is subject to appropriate disciplinary action as well as criminal penalties provided by federal law. Usage of such material is only appropriate when that usage constitutes fair use under the Copyright Act. As a UT Dallas student, you are required to follow the institutions copyright policy (Policy Memorandum 84-I.3-46). For more information about the fair use exemption, see

<http://www.utsystem.edu/ogc/intellectualproperty/copypol2.htm>

#### Email Use

The University of Texas at Dallas recognizes the value and efficiency of communication between faculty/staff and students through electronic mail. At the same time, email raises some issues concerning security and the identity of each individual in an email exchange. The university encourages all official student email correspondence be sent only to a students U.T. Dallas email address and that faculty and staff consider email from students official only if it originates from a UTD student account. This allows the university to maintain a high degree of confidence in the identity of all individual

corresponding and the security of the transmitted information. UTD furnishes each student with a free email account that is to be used in all communication with university personnel. The Department of Information Resources at U.T. Dallas provides a method for students to have their U.T. Dallas mail forwarded to other accounts.

#### Withdrawal from Class

The administration of this institution has set deadlines for withdrawal of any college-level courses. These dates and times are published in that semester's course catalog. Administration procedures must be followed. It is the student's responsibility to handle withdrawal requirements from any class. In other words, I cannot drop or withdraw any student. You must do the proper paperwork to ensure that you will not receive a final grade of "F" in a course if you choose not to attend the class once you are enrolled.

#### Student Grievance Procedures

Procedures for student grievances are found in Title V, Rules on Student Services and Activities, of the university's Handbook of Operating Procedures. In attempting to resolve any student grievance regarding grades, evaluations, or other fulfillments of academic responsibility, it is the obligation of the student first to make a serious effort to resolve the matter with the instructor, supervisor, administrator, or committee with whom the grievance originates (hereafter called the respondent). Individual faculty members retain primary responsibility for assigning grades and evaluations. If the matter cannot be resolved at that level, the grievance must be submitted in writing to the respondent with a copy of the respondent's School Dean. If the matter is not resolved by the written response provided by the respondent, the student may submit a written appeal to the School Dean. If the grievance is not resolved by the School Dean's decision, the student may make a written appeal to the Dean of Graduate or Undergraduate Education, and the dean will appoint and convene an Academic Appeals Panel. The decision of the Academic Appeals Panel is final. The results of the academic appeals process will be distributed to all involved parties. Copies of these rules and regulations are available to students in the Office of the Dean of Students, where staff members are available to assist students in interpreting the rules and regulations.

#### Incomplete Grade Policy

As per university policy, incomplete grades will be granted only for work

unavoidably missed at the semesters end and only if 70% of the course work has been completed. An incomplete grade must be resolved within eight (8) weeks from the first day of the subsequent long semester. If the required work to complete the course and to remove the incomplete grade is not submitted by the specified deadline, the incomplete grade is changed automatically to a grade of F.

#### Disability Services

The goal of Disability Services is to provide students with disabilities educational opportunities equal to those of their non-disabled peers. Disability Services is located in room 1.610 in the Student Union. Office hours are Monday and Thursday, 8:30 a.m. to 6:30 p.m.; Monday and Wednesday, 8:30 a.m. to 7:30 p.m.; and Friday, 8:30 a.m. to 5:30 p.m. The contact information for the Office of Disability Services is: The University of Texas at Dallas, SU 22 PO Box 830688 Richardson, Texas 75083-0688 (972) 883-2098 (voice or TTY) [disabilityservice@utdallas.edu](mailto:disabilityservice@utdallas.edu) If you anticipate issues related to the format or requirements of this course, please meet with the Coordinator of Disability Services. The Coordinator is available to discuss ways to ensure your full participation in the course. If you determine that formal, disability-related accommodations are necessary, it is very important that you be registered with Disability Services to notify them of your eligibility for reasonable accommodations. Disability Services can then plan how best to coordinate your accommodations. It is the students responsibility to notify his or her professors of the need for such an accommodation. Disability Services provides students with letters to present to faculty members to verify that the student has a disability and needs accommodations. Individuals requiring special accommodation should contact the professor after class or during office hours.

#### Religious Holy Days

The University of Texas at Dallas will excuse a student from class or other required activities for the travel to and observance of a religious holy day for a religion whose places of worship are exempt from property tax under Section 11.20, Tax Code, Texas Code Annotated. The student is encouraged to notify the instructor or activity sponsor as soon as possible regarding the absence, preferably in advance of the assignment. The student, so excused, will be allowed to take the exam or complete the assignment within a reasonable time

after the absence: a period equal to the length of the absence, up to a maximum of one week. A student who notifies the instructor and completes any missed exam or assignment may not be penalized for the absence. A student who fails to complete the exam or assignment within the prescribed period may receive a failing grade for that exam or assignment. If a student or an instructor disagrees about the nature of the absence [i.e., for the purpose of observing a religious holy day] or if there is similar disagreement about whether the student has been given a reasonable time to complete any missed assignments or examinations, either the student or the instructor may request a ruling from the chief executive officer of the institution, or his or her designee. The chief executive officer or designee must take into account the legislative intent of TEC 51.911(b), and the student and instructor will abide by the decision of the chief executive officer or designee.

These descriptions and timelines are subject to change at the discretion of the Professor.