

**Seminar in Futures and Options**  
**(MGMT 576-001; CRN: 34088)**  
**Spring 2015**

**Instructor:** Dr. Hsuan-Chi Chen

**Class Schedule:** Tuesday and Thursday; 4:00 pm -- 5:15 pm

**Classroom:** ASM 1065

**Office Location:** ASM 2091

**Office Hours:** TR 1:00 pm - 2:00 pm; 3:30 pm - 4:00 pm or by appointment

**E-mail Address:** [chenh@unm.edu](mailto:chenh@unm.edu)

(Please indicate the course number "MGMT 576" in the subject section of your e-mail.)

**Office Phone Number:** (505) 277-4702

**Materials:**

Required

- (1) Text: Don Chance and Robert Brooks, *An Introduction to Derivatives and Risk Management*, 10th edition, 2015.
- (2) Papers from various academic journals (available from UNM libraries/UNM Learn).
- (3) Calculator: Financial calculator preferred
- (4) Microsoft Excel

Recommended

*The Wall Street Journal*

**Course Description:**

This course presents models and various real-world applications for derivative pricing, derivative strategies, and risk management. Particular attention is given to the following areas: (1) models for option pricing and hedging (risk management), (2) models for futures pricing and hedging, (3) various trading strategies and real-world applications. (4) Quantitative techniques used in this course include binomial methods, Black-Scholes (BS) model, and basic statistics. Students will be able to use Microsoft Excel to implement or analyze pricing models, trading strategies, and their applications. (5) Case assignment and project are also used to study financial decision problems. To develop analytical and presentation skill which are usually required in the job market, graduate students are expected to make in-class presentation in an efficient and professional way.

To get some idea of the quantitative skills we require in the course, take a look at the following famous BS formula for pricing a call option on a stock:

$$C_o = S_o N(d_1) - X e^{-rT} N(d_2).$$

Definitions:

$$d_1 = \frac{\ln\left(\frac{S_o}{X}\right) + \left(r + \frac{\sigma^2}{2}\right)T}{\sigma\sqrt{T}} \quad d_2 = d_1 - \sigma\sqrt{T}$$

$C_o$  = current call option premium

$S_o$  = current stock price

$X$  = exercise price

$\sigma$  = annual standard deviation of the stock

$T$  = time to maturity in years

$r$  = annualized, continuously compounded, riskless rate of return

$N(d)$  = cumulative standard normal distribution

$e \approx 2.71828$ , the base of the natural logarithm

$\ln$  = the natural logarithm

### Objectives:

The specific objectives of this course are to obtain fundamental and some advanced knowledge in the following topics:

1. Nature of financial derivatives
2. Speculation, arbitrage, and hedging
3. Principles of option pricing, minimum and maximum values of options
4. Put-call parity (Excel skills included)
5. Binomial models (Excel skills included)
6. Black-Scholes Model and extensions (Excel skills included)
7. Implied volatility (Excel skills included)
8. Real-world applications based on the BS model (Excel skills included)
9. Option trading strategies (Excel skills included)
10. Early exercise of stock options and investor behavior
11. Put option sales and market timing
12. Collars in mergers and acquisitions
13. Backdating and stock option grants
14. Collar hedging and corporate insiders (Excel skills included)
15. Merton distance to default model and applications (Excel skills included)
16. Financial engineering (using equity-linked CDs and Preferred Equity Redemption Cumulative Stocks (PERCS) as examples; Excel skills included)
17. Principles of pricing forwards and futures
18. Futures hedging strategies (Excel skills included)

## Grading Scale:

|    |            |
|----|------------|
| A+ | 97 – 100   |
| A  | 93 – 96.99 |
| A- | 90 – 92.99 |
| B+ | 87 – 89.99 |
| B  | 83 – 86.99 |
| B- | 80 – 82.99 |
| C+ | 77 – 79.99 |
| C  | 73 – 76.99 |
| C- | 70 – 72.99 |
| D+ | 67 – 69.99 |
| D  | 63 – 66.99 |
| D- | 60 – 62.99 |
| F  | below 60   |

- (1) The first three exams: 34% (17% each for the two exams with higher scores; the exam with the lowest score will be dropped)
- (2) Final exam (**comprehensive and required**): 20%
- (3) Case and Project: 16% (8% for each case and project)
- (4) In-class presentation: 20%
- (5) Attendance/homework: 10% (equally weighted for each class session and homework assignment)

## Exams:

There will be four exams throughout the semester. The first three exams are held during our normal class hours on the exam dates specified in the course outline below. The final exam is an exception; it follows the UNM final examination schedule. Please mark these important exam dates on your calendar.

The exams consist of all numerical problems. **Make-up exams will not be given.** However, I will drop the lowest grade among the first three exams (any missed exam automatically equals zero). When taking exams, you are allowed to bring in a financial calculator. You may also bring one 8.5”x11” sheet of paper, on both sides of which you can jot down formulas or notes you would like to use during the exam. This formula sheet cannot be shown to other students during the exam.

## Case:

There will be one case assignment. Students are encouraged to form case groups/teams with **a maximum of two members on each team** to work out case problems. Due dates and relevant information will be given when the corresponding material has been covered. For the case, each team will turn in a typed report on the due date. No late reports will be accepted.

To access to your CoursePack, the following procedures are helpful:

1. Open the XanEdu "Login/Register" page at:  
<http://coursepacks.xanedu.com/login.shtml?PackId=490011>
2. If you have previously registered for another CoursePack, log in. If not, click the "register" link underneath the "Students" heading. Complete the registration page, and click Continue.
3. Confirm your CoursePack Selection, and complete the purchase form. Note that shipment of print copies to students does not happen automatically; students must request their print copy at purchase time.

Choose one of the following options for your CoursePack delivery:

Option 1 is "Digital access plus packaged print copy (price does not include shipping)."  
➔ Your personal print copy will be shipped to you. Shipping of a print copy is for valid U.S. addresses only.

Option 2 is "Digital access with desktop printing."  
➔ You will have immediate access to your Digital CoursePack. You will not receive a printed copy of the CoursePack. You can print your CoursePack yourself, if your system hardware and connectivity supports downloading and printing very large files from the Internet. If you are not sure if your system supports this, XanEdu recommends that you select Option 1.

4. After completing the procedures, you will be taken directly to "My XanEdu" where you can access to your digital CoursePack. If you have questions through the process, please contact XanEdu Customer Service at 1-800-218-5971.
5. Please purchase the case after you decide to take this class.

### **Project:**

There will be one project for this course related to option trading and analytical techniques we will cover in class. Students are encouraged to form project groups/teams with **a maximum of two members on each team**. Due dates and relevant information will be given when the corresponding material has been covered. For the project, each team will turn in a typed report (single-spaced; may include exhibits, tables, and references to support arguments) on the due date. No late reports will be accepted.

Also, for avoiding the free rider problem, the team coordinator should briefly state the contributions of all members and obtain their signatures for confirming the coordinator's statements **on the cover page of each project/case report**. Each individual signature on the cover page of any report is counted as one attendance record (see the attendance/homework policy below) of that individual member. If the team coordinator has made reasonable efforts to obtain the signatures of team members (for example, some e-mails to the whole team can serve as evidence of notification) but still cannot get some by the due date, the responsibility is on the part of each individual member who does

NOT sign. No excuse will be accepted because the signature should be done by the due date.

If any member on a team does not make any meaningful contribution to the joint project (or case study), that member should be dismissed from the team. The team should e-mail a notice of the member's removal to both the non-contributing member and the instructor at least 24 hours before the due date.

### **In-class presentation:**

Each team is going to present 1-2 academic papers (depending on class size) in the class, which is randomly assigned by the instructor after all teams are formed completely (please find team members within one week after our classes begin). Presentations are expected to not exceed 30 minutes. Evaluation would be based on the quality of presentation which includes effective background introduction and the main points/issues/findings/conclusions of the paper. Each team should have their power point file (or PDF file) available for the class at least one day before the presentation (counted in your presentation performance).

### **Attendance/Homework:**

This course is demanding in quantitative skills. Missing one class can present an obstacle to subsequent learning. For this reason, students are expected to attend class regularly and participate in discussions. Please come to class on time and turn off your communication devices before class.

Attendance sheets may be signed during the class and will serve as your attendance records. Homework will be assigned for practicing numerical problems and improving your quantitative skills. No late homework assignments will be accepted.

Attendance records (including the signature on homework that you turn in) and homework assignments (counted **only when you practice at least 2/3 of all sub-problems in each homework assignment**) will be equally weighted as records of your class participation and will count toward your semester grade. If you turn in homework with signature but you do NOT practice at least 2/3 of all sub-problems on the homework due date, you receive one attendance record but miss one homework (practice) record. For example, student S signed 18 out of 20 attendance sheets (including each homework signature) and missed one out of ten homework assignments. Thus, student S completed 27 out of 30 records in total. Since each record is equally weighted, the average for attendance/homework is 90 (27/30) and contributes 9.0 points (90\*10%) to the semester grade.

### **Miscellaneous Questions:**

**Q:** Should students be allowed to use Excel during exams with time-consuming calculation? The issue here is that some calculations required during exams are very time-consuming if done manually, leaving students insufficient time to complete the

exams. On the other hand, it is important for students to acquire strong computational skills and not become dependent on Excel or other technical aids.

**A:** I will give a few quizzes/assignments in which students have to show their computation details step by step without using Excel. For instance, students may be asked to manually go through the steps of calculating (1) the natural logarithm of (stock price/strike price); (2) the parameters  $d1$  and  $d2$ ; and (3)  $N(d1)$ ,  $N(d2)$ , and discounting in order to obtain the BS model price. These quizzes/assignments will assure both the instructor and the students that students have acquired the basic computational skills. Later exams may allow students to use Excel so that they can avoid devoting too much time to complex calculations during the limited exam time. One benefit of using Excel will be to allow students to focus more on applications rather than on time-consuming calculations during the exams.

### **Academic Integrity:**

**Anderson School of Management faculty, staff and students commit to values of trust, honesty, integrity, and accountability. We will not tolerate academic dishonesty. By enrolling in any course at Anderson, the student accepts the Anderson Academic Honesty Code and affirms the following pledge:**

*I will not lie, cheat, fabricate, plagiarize or use any other dishonest means to gain unfair academic advantage.*

Any violation of the code of conduct will be taken very seriously and appropriate sanctions will be applied. FOR FULL TEXT OF ANDERSON'S ACADEMIC HONESTY CODE, please visit <http://www.mgt.unm.edu/honesty>.

### **ADA Statement:**

Reasonable accommodation will be given to any individual with a legitimate disability. Please contact the instructor privately for arrangements. If you are a qualified person with disabilities who might need appropriate academic adjustments, please communicate with me as soon as possible so that we may make appropriate arrangements to meet your needs in a timely manner. Frequently, we will need to coordinate accommodating activities with other offices on campus. Course materials can be made available in alternative formats. (Services on Campus in UNM Pathfinder)

## **Course Outline**

### **Part 1: Options**

- I. Introduction and Structure of Options Markets  
*Textbook: Chapters 1 and 2*
- II. Principles of Option Pricing

*Textbook: Chapters 3*

- III. Binomial Pricing Model (Basic)  
*Textbook: Chapter 4*

**Exam #1 (February 5, Thursday)**

- IV. Binomial Pricing Model (Extension)  
*Textbook: Chapter 4*
- V. Black-Scholes Model (Comparative Static)  
*Textbook: Chapter 5*
- VI. Black-Scholes Model (Further Topics)  
*Textbook: Chapter 5*

**Exam #2 (March 5, Thursday)**

- VII. Applications using Black-Scholes Model
- VIII. Basic Option Strategies  
*Textbook: Chapter 6*
- IX. Advanced Option Strategies  
*Textbook: Chapter 7*

**Exam #3 (April 9, Thursday)**

**Part 2: Forwards and Futures**

- I. Structure of Forward and Futures Markets  
*Textbook: Chapter 8*
- II. Stock index futures
- III. Bond futures and asset allocation
- IV. Currency forward/futures

(Note: Parts II, III, and IV reorganize *Chapters 9-11* and discuss pricing, arbitrage, hedging, and target strategies using various derivatives.)

**Final Exam (May 5, Tuesday, 5:30 pm -7:30 pm; UNM final examination schedule)**

**Note:** The final exam is a cumulative exam based on the requirement of finance area. Also, the exam is held in our regular meeting room.

\*Course outline is tentative and may be changed.