



FIN 036: Derivatives and Risk Management

Term: 2020 Winter Session

Instructor: Staff

Language of Instruction: English

Classroom: TBA

Office Hours: TBA

Class Sessions Per Week: 6

Total Weeks: 4

Total Class Sessions: 25

Class Session Length (minutes): 145

Credit Hours: 4

Course Description:

The course introduces both the theory and the application of derivatives markets and their uses in portfolio allocation and risk management. Several derivative assets will be provided for students, such as futures, forwards, swaps, and options. Other topics will also cover in this course: mechanics of future markets, hedging strategies using futures, interest rate futures, determination of forward and future prices, interest rate futures, mechanics of options markets, properties of stock options, trading strategies involving options, binomial trees, the black-scholes-merton model, employee stock options, interest rate options.

Learning objectives:

After having followed the course activities the student will be able to:

- Understand the financial derivatives institutions and the operations of Derivatives markets
- Understand the definition of a wide range of derivatives, including forwards, futures, swap, and credit derivatives, understand the techniques to determine their prices
- Describe the price on options using the binomial framework, the Black-Scholes framework
- Analyze the feasibility of option pricing
- Acquire knowledge of numerical procedures



- Describe and apply financial derivatives theories and analytic tools for hedging risk, measuring risk, and controlling risk.

Course Materials:

John C. Hull. *Fundamentals of Futures and Options Markets*, 9th edition/global edition, Pearson.

Course Format and Requirements:

This course has 25 class sessions in total. Each class session is 145 minutes in length. The main format of this course is lecturing and class discussion. Before the class, the tutor must be prepared with fertile resources presented in PPT slides.

There should be no interruption of both other students and instructor and no talking out of turn during lectures unless called upon to answer a question. You are encouraged to ask questions or put up with your independent and unique solution, since extra credit may be given for thoughtful questions and solutions.

Laptop and cell phone regulation: Please turn off all cell phones during lecture. No texting during class lectures.

Attendance:

Participation is mandatory for successful completion of this course. Attendance will be recorded at the beginning of each class. Absences due to health can be excused only if the student brings a signed note from his or her health care provider.

Grading Scale:

A+: 98%-100%

A: 93%-97%

A-: 90%-92%

B+: 88%-89%

B: 83%-87%

B-: 80%-82%

C+: 78%-79%

C: 73%-77%



C-: 70%-72%

D+: 68%-69%

D: 63%-67%

D-: 60%-62%

F: Below 60%

Course Assignments:

Case studies:

There will be three case studies in this course. You are responsible to finish a rigorous analysis of the cases and be ready for class discussion. You should show your critical thinking and your understanding of concepts and theories and integrate them with your analysis. You should devote enough time and energy to the assignments. The total paper should be 5 pages, double-spaced. Exhibits, tables and calculations can be attached to the papers as required. Late submissions after the case discussion will not be accepted.

Problem Sets:

There will be five problem sets in total, which will test your comprehension of course materials. Students should finish topic-related problem sets before due date. All problem sets will be closely related to topics mentioned in class. Some of the questions in the exam papers will also be created related to the questions in daily problem sets.

Exams:

There will be two midterm exams and one final exam during the course. In the exams, you are responsible to explain theoretical concepts, do short answer and problem solving questions. The exams will be close-book. Also, you are not allowed to communicate with your classmates. Students are required to take all exams, and there are NO MAKE-UP EXAMS.

Course Assessment:

Attendance	5%
Problem Sets	10%
Midterm Exams 1	17.5%
Midterm Exams 2	17.5%
Case Studies	20%
Final Exam	30%



Total	100%
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Course Schedule:

Week	Topics	Assignments
Week One (Class 1~6)	<ul style="list-style-type: none"> • Course overview and syllabus • Introduction <ul style="list-style-type: none"> Futures contracts History of futures markets Forward contracts Options Types of trader Hedgers • Mechanics of future markets <ul style="list-style-type: none"> Opening and closing futures positions Specification of a futures contract The operation of margin accounts OTC markets Forward vs. futures contracts • Hedging strategies using futures <ul style="list-style-type: none"> Basic principles Arguments for and against hedging Basis risk Cross hedging Stock index futures • Interest rate futures <ul style="list-style-type: none"> Types of rates Measuring interest rates Zero rates 	<ul style="list-style-type: none"> • Problem set 1 • Case study 1
Week Two (Class 7~12)	<ul style="list-style-type: none"> • Interest rate futures <ul style="list-style-type: none"> Bond pricing Determining treasury zero rates Forward rates • Determination of forward and future prices <ul style="list-style-type: none"> Investment assets vs. consumption assets Short selling Assumptions and notation 	<ul style="list-style-type: none"> • Problem set 2 • Midterm exam 1 • Case study 2



	<p>Forward price for an investment asset Known income and yield</p> <ul style="list-style-type: none">• Interest rate futures Day count and quotation conventions Treasury bond futures Eurodollar futures Duration• Swaps Mechanics of interest rate swaps Day count issues Confirmations The comparative-advantage argument Forward rates	
Week Three (Class 13~18)	<ul style="list-style-type: none">• Mechanics of options markets Types of option Option positions Underlying assets Specification of stock options Trading Commissions Margin requirements• Properties of stock options Factors affecting option prices Assumptions and notation Upper and lower bounds for option prices Put-call parity• Trading strategies involving options Principal-protected notes Strategies involving a single option and a stock Spreads Combinations• Introduction to binomial trees A one-step binomial model and a no-arbitrage argument Risk-neutral valuation Two-step binomial trees	<ul style="list-style-type: none">• Problem set 3• Problem set 4• Midterm exam 2



<p>Week Four (Class 19~25)</p>	<ul style="list-style-type: none"> • Valuing stock options: the black-scholes-merton model <ul style="list-style-type: none"> Assumptions about how stock prices evolve Expected return Volatility Estimating volatility from historical data Assumptions underlying black-scholes-merton • Employee stock options <ul style="list-style-type: none"> Contractual arrangements Accounting issues Valuation Backdating scandals • Binomial trees in practice <ul style="list-style-type: none"> The binomial model for a non-dividend -paying stock Using the binomial tress for options on indices, currencies, and futures contracts The binomial model for a dividend-paying stock Extensions of the basic tree approach • Interest rate options <ul style="list-style-type: none"> Exchange-traded interest rate options Embedded bond options Black’s model European bond options Interest rate caps Term structure models Basic numerical procedures • Course summary and review for final exam 	<ul style="list-style-type: none"> • Case study 3 • Problem set 5 • Final exam
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Academic Integrity:

Students are encouraged to study together, and to discuss lecture topics with one another, but all other work should be completed independently. Cheating and/or plagiarism in any form are strictly prohibited.

Students are expected to adhere to the standards of academic honesty and integrity that are described in the Shanghai Normal University’s *Academic Conduct Code*. Any work suspected of violating the standards of the *Academic Conduct Code* will be reported to the Dean’s Office.

Penalties for violating the *Academic Conduct Code* may include dismissal from the program. All



students have an individual responsibility to know and understand the provisions of the *Academic Conduct Code*.

Special Needs or Assistance:

In case that you have a learning disability, a medical issue, or any other type of problem that may affects your professors' judgement about what you have learned from this course or about your academic achievement, please contact the Administrative Office immediately. Our goal is to help you learn, to improve, not to penalize you for issues which mask your learning.