

# 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: 5 Total Weeks: 3 Total Class Sessions: 15 Class Session Length (minutes): 240 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.

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

## Course Assessment:



Total

100%

# **Course Schedule:**

Week	Topics	Assignments
Week One	Welcome, Course overview and syllabus	Problem set 1
	• Introduction	• Case study 1
	Futures contracts	• Problem set 2
	History of futures markets	• Midterm exam 1
	Forward contracts	
	Options	
	Types of trader	
(Class 1~5)	Hedgers	
	Mechanics of future markets	
	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	
	Basic principles	
	Arguments for and against hedging	
	Basis risk	
	Cross hedging	
	Stock index futures	
	• Interest rate futures	
	Types of rates	
	Measuring interest rates	
	Zero rates	
	Bond pricing	
	Encourage Forward rates	
	Determination of forward and future prices	
	• Determination of forward and future prices	
	Short colling	
	Assumptions and notation	
	Forward price for an investment asset	
	Known income and vield	
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	model	
Week Three	Assumptions about how stock prices evolve	
(Class 11~15)	Expected return	
	Volatility	
	Estimating volatility from historical data	
	Assumptions underlying black-scholes-merton	
	Employee stock options	
	Contractual arrangements	
	Accounting issues	
	Valuation	
	Backdating scandals	
	Binomial trees in practice	
	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	
	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	

## 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.