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| Course Information   |  |
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| Course Title :<br>FIN 320 Risk Management and Derivatives  | Semester : Winter 2019                             |
| Class Hours: Monday through Friday, 160 minutes each day   |  |
| Discussion Section: 3<br>hours each week   | Field Trip: According to professors' teaching plan |
| Prerequisites  |  |
| Principles of Microeconomics , Principles of Macroeconomics , Financial Management , Calculus , and Statistics . Those who have not met those prerequisites must obtain a permission from the course instructor in order to take this course.  |  |
| Textbooks and Reference  |  |
| <p>Required Texts:<br/>Fundamentals of Futures and Options Markets, by John C. Hull, 9th edition, 2016, Pearson, ISBN-13: 978-0134083247</p> <p>Reference Books and Online Resources:</p> <ol style="list-style-type: none"> <li>(1) <i>The Wall Street Journal</i></li> <li>(2) <i>Forbes</i></li> <li>(3) <i>The Black Swan: The impact of the Highly Improbable</i>, 2<sup>nd</sup> Edition, Nassim Taleb, Random House LLC, 2010</li> <li>(4) <i>Fooled by Randomness: The Hidden Role of Chance in Life and in the Markets</i>, Nassim Taleb, Random House LLC, 2008</li> <li>(5) <i>Critical Mass</i>, Philip Ball, 1<sup>st</sup> American ed. 2006.</li> <li>(6) <i>Thinking, Fast and Slow</i>, Daniel Kahneman, Farrar, Straus and Giroux, 2011, Sold by Macmillan (this book explains the foundation of behavioral finance and human instincts toward risk in decision making process; difference between rational and irrational thinking and how much you can trust your intuition when facing risks.)</li> <li>(7) <i>The (Mis)Behavior of Markets</i>, Benoit Mandelbrot and Richard L. Hudson, Published by Basic Books, 2007, Sold by Amazon Digital Services (this book explains the idea of mild risk and wild risk in nature and economy, and introduces the reader to the concept of fractal and some novel risk management tools derived from it. This book lets the reader think out of the box confined by the traditional views, and rethink risk and its management.)</li> </ol> |  |
| Course Outcomes  |  |
| Successful completion of the course will allow students to:  |  |



1. adopt a holistic view of risk and return;
2. understand the tools for measuring risks and their limitations;
3. apply various hedging techniques to manage business and financial risks;
4. price risky assets in a more systematic and economically sound way;
5. understand the implication of arbitrage-free principle and its critical role in asset pricing;
6. understand insurance and its role in managing risk, and some fundamental issues in insurance risk management;
7. understand financial derivatives, how to use them, and their limitations; and
8. be able to analyze contemporary economic issues such as financial and economic crises, and the role of financial derivatives and innovations in the that context.

**Course Description**

This course is designed to provide students with in-depth knowledge of the important concepts about risks and risk management in business. Students will learn how to carry out detailed analysis of the measurement of financial risk and get familiar with the tools and techniques to manage financial risk. While the emphasis is on financial risk, students will be exposed to broader areas where risk and risk management are relevant. For example, how to reduce operational risk is normally considered outside the traditional field of financial risk management, but it is a common risk in business with potentially big consequences. Duration matching is a risk-hedging technique widely used in the banking industry that can be applied to managing a business’s cash flows and its debt policy. All the concepts and techniques introduced in this course are closely related one way or the other. The ultimate goal is to give students a well rounded and solid knowledge base and the ability to carry out in-depth risk assessment and identify the best strategy in their decision making process.

Topics include risk and return, mapping out the landscape of risk, financial disasters and insurance, operational risk, understanding bankruptcy, global and foreign currency exchange risk, interest rate risk, credit risk, business and corporate risk, hedging techniques, financial derivatives – futures, call and put options, swaps, and exotic options and swaptions, and how to use them to reduce financial risk. Specifically, students will learn how some of those pricing frameworks are developed and how they are implemented in various situations. A strong quantitative background will be very helpful for the success in this course.

**Weekly Schedule (Jan. 7 – 26, 2019)**

| Week | Day | Topic   |
|------|-----|---|
| 1    | 1   | Introduction; overview of business risk and financial risk  |
|      | 2   | Insurance: when to or not to use insurance; risks in insurance  |
|      | 3   | Options and options markets   |
|      | 4   | Financial options and pricing; normal distribution assumption and pitfalls  |
|      | 5   | Using options to manage risk – trading strategies   |
| 2    | 1   | The Black-Scholes-Merton model, the binomial method, risk-neutral method and the concept of martingale (optional) |
|      | 2   | The Greek letters; introduction to futures and futures markets  |



|   |               |  |
|---|---------------|--|
|   | 3             | Pricing futures contract for financial assets and commodities; using futures as a risk-hedging tool; contango and normal backwardation |
|   | 4             | Discussion and review  |
|   | 5             | <b>Midterm Exam (in class)</b>   |
| 3 | 1             | Interest rate risk, duration-matching and interest rate futures  |
|   | 2             | Interest rate swap; comparative advantage  |
|   | 3             | Currency swap  |
|   | 4             | Credit derivatives, exotic derivatives (weather, index, Asian, ...)  |
|   | 5             | Special Topics: financial crises; power-law distribution; discussion and course review   |
|   | Jan. 27 or 28 | <b>Final Exam (in class)</b>   |

**Note:**

- The course schedule is subject to change (please follow the announcements in class). If time permits, we will also cover miscellaneous topics based on students' interests.
- The instructor will offer 3 hours of discussion or help session each week and students are encouraged to seek extra help by making arrangements with the instructor or the teaching assistant.

**Grading**

|                              |             |
|------------------------------|-------------|
| Attendance and participation | 15%         |
| Pop quizzes and homework     | 15%         |
| Midterm exam                 | 30%         |
| Final exam                   | 40%         |
| <b>Total</b>                 | <b>100%</b> |

Upon completion of this course, you receive a final grade. A final grade is a letter grade that carries with it a numerical value, as outlined below.

| Grade | Percentage |
|-------|------------|
| A     | 80-100     |
| B     | 70-79      |
| C     | 60-69      |
| D     | 50-59      |
| E     | 0-49       |



### **Policy on Absence**

Class attendance is mandatory. All students are expected to make their best effort to attend all classes and participate in class dynamics actively. This includes (1) asking and answering questions; (2) responding to the instructor's communications; (3) paying attention; and (4) not using cell phones without instructor's permission.

Quizzes are not announced in advance. There will be no make-up for missed exams or quizzes. If your absence is justified, you are expected to bring the relevant document to the instructor. It is at the instructor's discretion whether your absence is excusable or not. In practice, missing more than 3 classes will make your learning very difficult. Not taking an exam will result in an F as the final course grade.

### **Academic Integrity**

We strictly follow the academic ethics codes of the school. Academic integrity is unconditionally upheld in this course. All assignments, quizzes and exams are to be completed independently. However, active discussion and team spirit are encouraged in appropriate context, for example, before and after you complete an assignment, in preparation of the quizzes and exams, reviewing a topic or studying it in advance, etc. Cheating and plagiarism in any fashion are absolutely unacceptable. Upon verification, violators will lose points commensurate with the violation up to failing the course.

### **Disability accommodation**

Any student who needs special accommodation due to the impact of a disability should contact the instructor and/or the university within the first week of the class.