

Derivative Securities and Risk Management (Postgraduate) **FIN-ISS305**

Course Description

The course will focus on the application of financial derivatives and financial engineering to the issues and problems of financial risk management. The first part of the course concentrates on introduction and pricing of derivative securities such as forwards, futures, options and swaps. The second part focuses on the application of these derivative securities for financial risk management within corporations and financial institutions. Topics will include introduction to derivatives markets, pricing futures and forwards, Binomial model for pricing options, introduction to stochastic calculus, Ito's lemma, no arbitrage pricing of options and Black Scholes model, option greeks, pricing swaps, managing market risk, credit risk and liquidity risk. The course will also cover real world case studies to illustrate practical application of financial derivatives to solve complex risk management problems.

Required Texts

Options, Futures and other Derivatives 2018 by John Hull, 10th Edition, Pearson.

Value at Risk: The New Benchmark for Managing Financial Risk 2006 by Philippe Jorion, 3rd Edition, McGraw-Hill Education.

Other Reading materials will be provided through your student center

Prerequisite

Postgraduate status needed. Students are assumed to have knowledge that is required for this course.

Course Requirements

During the term, there will be one midterm exam (20%), one final exam (30%) and two case studies (20% each), Responses and questions around class readings and participation so make sure you are there and prepared (10%).

Learning Outcomes

- Use knowledge of key concepts in Finance to facilitate financial decision making.
- Think critically about financial risk management problems and provide potential solutions.
- Develop a strong understanding of derivative instruments and their applications.
- Communicate effectively

Evaluation and Grading

A	93-100	B-	80-82	D+	67-69
A-	90-92	C+	77-79	D	63-66
B+	87-89	C	73-76	D-	60-62
B	83-86	C-	70-72	F	0-59

Course Hours

The course has 20 class sessions in total. Each class session is 150 minutes in length, for a total of 3000 minutes of in-class time. Students are expected to spend 15-20 hours per week outside of class. The University awards **4** credits for this course. Different universities may count course credits differently. Consult officials at your own home institution.

Attendance

Occasionally, due to illness or other unavoidable circumstance, a student may need to miss a class. The University's policy requires a medical certificate to be excused. Any absence may impact on the student's grade. Moreover, **the University's policy is that a student who has more than 3 absences will fail the course. Arriving late or leaving early will count as a partial absence.**

Academic Honesty

The University expects all students to do their own work. Instructors will fail assignments that show evidence of plagiarism or other forms of cheating and will also report the student's name to the University administration. A student reported to the University for cheating is placed on disciplinary probation; a student reported twice is suspended or expelled.

Disability Accommodation

Any student who needs special accommodation due to the impact of disability should inform the University within 10 days before the program starts.

Tentative Schedule

Period	Weekly Contents	Readings and Homework
1	<ul style="list-style-type: none"> • Introduction and overview • Introductions to Futures Markets 	<ul style="list-style-type: none"> • Hull Chapter 1-2
2	<ul style="list-style-type: none"> • Hedging strategies using Futures • Interest rates 	<ul style="list-style-type: none"> • Hull Chapter 3-4
3	<ul style="list-style-type: none"> • Determination of forward and futures prices • Interest rate futures 	<ul style="list-style-type: none"> • Hull Chapter 5-6
4	<ul style="list-style-type: none"> • Swaps • Mechanics of Options Markets 	<ul style="list-style-type: none"> • Hull Chapter 7, 10
5	<ul style="list-style-type: none"> • Properties of stock options • Trading strategies involving options 	<ul style="list-style-type: none"> • Hull Chapter 11-12
6	<ul style="list-style-type: none"> • Binomial trees • Stochastic processes and Ito's Lemma 	<ul style="list-style-type: none"> • Hull Chapter 13-14
7	<ul style="list-style-type: none"> • The Black—Scholes—Merton model • Options on stock indices and currencies 	<ul style="list-style-type: none"> • Hull Chapter 15,17
8	<ul style="list-style-type: none"> • Option Greeks • Volatility Smile 	<ul style="list-style-type: none"> • Hull Chapter 19,20
9	<ul style="list-style-type: none"> • The rationale for risk management • Case Study: American Barrick Resource Corporation: Managing Gold Price Risk (HBS Case # 9-293-128) 	<ul style="list-style-type: none"> • Jorion Chapter 1-2
10	<ul style="list-style-type: none"> • Midterm Exam 	
11	<ul style="list-style-type: none"> • Energy and commodity derivatives. • Case Study: 2012 Fuel Hedging at JetBlue Airlines (UVA Darden Case # 6682) 	<ul style="list-style-type: none"> • Hull Chapter 35
12	<ul style="list-style-type: none"> • VAR-Based Regulatory Capital • Tools for Measuring Risk 	<ul style="list-style-type: none"> • Jorion Chapter 3-4
13	<ul style="list-style-type: none"> • Computing VAR • Backtesting VAR 	<ul style="list-style-type: none"> • Jorion Chapter 5-6
14	<ul style="list-style-type: none"> • Portfolio Risk: Analytical Methods • Credit Risk Management 	<ul style="list-style-type: none"> • Jorion Chapter 7,18
15	<ul style="list-style-type: none"> • Using VAR to Measure and Control Risk • Using VAR for Active Risk Management 	<ul style="list-style-type: none"> • Jorion Chapter 15-16
16	<ul style="list-style-type: none"> • VAR and Risk Budgeting in Investment Management 	<ul style="list-style-type: none"> • Jorion Chapter 13,17

	<ul style="list-style-type: none"> Liquidity Risk 	
17	<ul style="list-style-type: none"> Stress Testing Risk Management Guidelines and Pitfalls 	<ul style="list-style-type: none"> Jorion Chapter 14.21
18	<ul style="list-style-type: none"> Derivatives mishaps and what we can learn from them 	<ul style="list-style-type: none"> Hull Chapter 37
19	<ul style="list-style-type: none"> Review 	
20	<ul style="list-style-type: none"> Final Exam 	

Please note the schedule is subject to change