



MGT/P 263: Derivative Securities (JOINT)

Contact Information

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Course Description

This is a graduate level introductory course on derivative securities designed for students specializing in finance and risk-management. The course examines the pricing and behavior of financial derivatives, including options, futures, forwards, swaps and credit derivatives, to provide an understanding on the way market participants (firms, financial institutions, hedgers, and traders) utilize these instruments. The focus is therefore on the rationale behind asset pricing and trading strategies, rather than on quantitative methods. Although, some mathematics is required during the course, topics are covered from a conceptual level.

The objective of this course is to explain the theories and concepts that are essential to valuation and application of financial derivatives. Key concepts include Market Completeness, Risk-Neutral Probability, No Arbitrage Principle and the Law of One Price.

Course Materials

Textbooks: *Derivatives Principles and Practice 1st Edition*, by Sundaram and Das

Textpak: supplemental readings.

Financial Calculator: Texas Instruments BAII Plus or similar

Microsoft Excel (2007 or later)

Office hours / Out of Class Discussions:

There will be an online Forum to answer questions and allow discussions on course topics (anonymity is optional). I will be available during designated hours or by special appointment via Skype. Please email your questions or concerns in advance to allow me time to prepare.

Course Policy, Assignments, Exams & Grading Criteria

Assignments (20% of overall grade)

There are four (4) individual assignments consisting of problem sets. Submissions must be in electronic format (Excel and pdf) with email time stamps serving as proof of punctuality. All assignments are due by 10pm on the evening before the respective class sessions (see course outline). Late submissions are not allowed since the solutions will be covered during class. There are also required reading before class sessions, which cover the topics covered during that session.

Midterm Exam (20% of overall grade)

Halfway through the course (session five), there is a 90 minute in class, closed book exam covering the material up to that point. Questions are a combination of multiple choice and qualitative short answers. A financial calculator is required. There is no make-up session. Financial markets are unforgiving and so must we be.

Group Project (20% of overall grade)

The group project is discussed during the first class session. Students are divided in groups (second class session) and each group is given a scenario, which involves a future financial exposure requiring hedging techniques using derivatives. The portfolio will need to be rebalanced throughout the course and the results will be presented during session ten. Deliverables include a maximum 1000 word paper which explains the rationale behind strategy and product selection plus a spreadsheet of the portfolio profit & loss and position rebalances. The exercise involves real market data and news. The grading criteria is based on the application of the lessons covered in the course.

Final exam (25% of overall grade)

Same format as the Midterm – 90 minute closed book, in class. A financial calculator is required. There is no make-up session.

Class Participation (10% of overall grade)

Each of the ten class sessions counts for 1% of the overall grade for a total of 10%. Make sure to bring and display your Tent card to class to facilitate taking attendance and to allow for better interaction during discussions. Points are awarded for participation as follows: ½ point for being on time and present during the entire lecture. ½ point for constructive comments or questions which demonstrates you have done the assigned reading.

Problem sets (4)	20%	Equally weighted: 5% each
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Midterm Exam	25%	Closed book
Group Project	20%	Groups of 4-5
Final Exam	25%	Closed book
Participation	10%	1% for each class session

Tentative Course Outline

(This is a tentative course outline and assigned readings: topics and assigned readings are subject to change)

Session 1: Introduction to Derivative Securities, Markets & Participants

- Non-assesed quiz to assess the level of knowledge of the class
- Definitions and general types of Financial Derivatives
- Review of Probability & Statistics (distributions, randomness, expectations)
- Role of Institutions/Desks, Markets & Participants in Derivatives
- Risks hedged by Derivatives and exposure to new risks
- Discussion of Group Project
- **Recommended reading: Textpak ; notes from MGT/P/B 203**

Session 2: Delta One Derivatives: Futures & Forwards

- Overview of asset pricing models and term structure of interest rates
- Market structure and pricing mechanism of Futures v Forwards
- Hedging and arbitrage strategies and associated risks / costs
- Product Types: Agricultural, Energy, Equity, FX, Interest Rates, Metals
- Term Structure of Interest Rates concepts
- **Required reading: Textbook (selections) Ch. 1, 2, 3, 4, 26 ; Textpak**
- **Assignment 1: due before session 3**

Session 3: Forex & Interest Rate Derivatives

- Review of assignment 1
- Derivatives role in foreign exchange markets
- Bond futures markets
- Interest rate swaps and floating rate agreements
- Key Concepts: Comparative advantage, Basis risk, Carry trade
- Case study: A Long-Term Capital Management “Convergence Trade”
- **Required reading: Textbook (selections) Ch. 5, 6, 23, ; Textpak**
- **Assignment 2: due before session 4**

Session 4: Structured Products & Securitization

- Review of assignment 2
- Asset-Backed Securitization: motivation, techniques, risks
- Cash-flow of structured products: pass-through v waterfall

- Key concepts: SPVs, credit enhancement, regulatory arbitrage
- Mortgaged-Backed Securities: Private-label v Agency
- **Required reading: Textpak**

Session 5: Credit Derivatives

- Credit default models: Merton, KMV
- Exchanged Traded Notes v Funds
- CDO, CLO, CDS, Cash v Synthetic
- Role of Securitization and Credit Derivatives in Financial crisis
- Case Study: AIG
- Regulatory reform: Dodd Frank and Securitization
- **Required reading: Textbook Ch. 31 ; Textpak**

Session 6: Introduction to Non-linear Derivatives

- Overview of options markets
- Role of options in corporate finance
- ESOPs / LEAPS / Warrants
- Option terminology
- **Required reading: Textbook Ch. 7 ; Textpak**
- **MIDTERM EXAM (second half of session)**

Sessions 7, 8, 9: Options

- Overview of Volatility characteristics: Skewness, Clustering, Mean-reversion
- Key concepts: No Arbitrage Argument, Law of one price, Complete Markets
- Options payoffs, payoff-diagrams and breakeven points
- Motivation behind strategies: Spreads, Straddles, Covered Calls, etc.
- One-Step Binomial Tree Model analyzed
- Multi-Step Binomial Tree: from discrete to continuous time
- Black-Scholes Model: assumptions, formula, drawbacks
- Decomposition of Option prices and Put-Call parity
- Option Greeks and Dynamic portfolio hedging
- Delta hedging and volatility arbitrage
- **Required reading: Textbook (selections) Ch. 8,9,10,11,12,13,14 ; Textpak**
- **Assignment 3: due before session 8**
- **Assignment 4: due before session 9**

Session 10: Volatility & Exotic Products

- **GROUP PRESENTATIONS**
- Volatility Derivatives: Variance Swaps, VIX Futures & Options
- Overview of Exotic Options

- Review of key course concepts
- Review for Final Exam