

# STEVENS INSTITUTE OF TECHNOLOGY

## FE-620: Pricing and Hedging Syllabus

- Instructor:** Dragos Bozdog  
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Phone: (201) 216-5298
- Time:** FE-620-C: Wednesday (6:15pm-8:45pm)
- Room:** Buchard Building 118
- Office Hours:** Wednesday (12:00pm-12:50pm) or by appointment
- Objective:** This course deals with basic financial derivatives theory, arbitrage, hedging, and risk. Risk neutral pricing models using the Black-Scholes formula and binomial trees are discussed in detail. The course covers derivative instruments and underlines including stocks, bonds, forwards, futures, swaps, and options. By the end of the course, students will have good knowledge of how these products work, how they are used, how they are priced, and how financial institutions hedge their risks when they trade the products. Incorrect pricing of an instrument will create arbitrage opportunities. Risky positions are managed by proper hedging. Students are required to discover these arbitrage or hedging opportunities and enter simulated trades in an Interactive Broker (IB) paper trading account. IB paper trading accounts will be created for each student at the beginning of the semester.
- Prerequisite** Multivariable Calculus, FE 610, and programming in C++, or Java.
- Required Textbook:** John Hull. *Options, Futures, and Other Derivatives*. 2012. Eighth Edition. Prentice Hall. ISBN: 978-0132164948
- Grading:** Please submit files in PDF format (using Adobe Acrobat, PrimoPDF, or deskPDF)
- Homework Assignments – 50%  
A total of 10 assignments (week 1-10) with each assignment worth 5 points. Submit previous session's homework before the session start (deadline), solution will be discussed in class and published after the deadline. Assignment 2-10 on Hull's book (see schedule).
- Class Participation– 5%  
You will earn full grade (5 points) if you participating in asking or answering questions in class or by email.
- IB Arbitrage Assignment – 45%  
Three arbitrage or hedging trades entered through IB paper account, each worth 15 points. You are allowed to use the following types of instrument (stock, bonds, warrants, ETF, options, futures, currency, forwards, swaps) to construct 3 trades (each with 2 legs minimum). Trades entered can be left open or be closed by summary submission time. You are allowed to repeatedly manipulate positions once the trade is entered (open, increase, decrease, close, or reverse your positions, the repeating sequence is considered as one

trade). You will have a chance to discuss your trade in detail through Session 11-14. Trading summary to be submitted at the end of week 14. Please discuss 1) the reasons you enter the trade, 2) what worked, 3) what did not work, 4) how to improve this trade. Start to experiment with your trades early will allow you 1) to deploy capital (\$1 million) more effectively; 2) to have more time to monitor performance; 3) to test more ideas for the final report. Please contact [ibstudenttradinglab@interactivebrokers.com](mailto:ibstudenttradinglab@interactivebrokers.com) directly if you do not receive an invite by week 4.

#### FE 540 - Course Schedule

	Topic	Readings
Week 1	Introduction	Chapter 1
Week 2	Futures Markets Hedging Strategies Using Futures	Chapter 2 & 3
Week 3	Interest Rates	Chapter 4
Week 4	Forward and Futures Prices Interest Rate Futures	Chapter 5 & 6
Week 5	Swaps Asset Backed Securities	Chapter 7 & 8
Week 6	Options Markets Properties of Stock Options	Chapter 9 & 10
Week 7	Trading Strategies Binomial Trees	Chapter 11 & 12
Week 8	BSM Model Employee Stock Options	Chapter 14 & 15
Week 9	Options on Stock Indices and Currencies Options on Futures	Chapter 16 & 17
Week 10	Greek Letters Volatility Smiles	Chapter 18 & 19
Week 11	Value at Risk	Chapter 21
Week 12	Credit Risk	Chapter 23
Week 13	Credit, Energy and Commodity Derivatives	Chapter 24 & 33
Week 14	Derivatives Mishaps	Chapter 35