

New York University Tandon School of Engineering

Department of Finance and Risk Engineering

Course Outline FRE 6123

Financial Risk Management

Fall 2018

Mirela M Ivan

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Lecture periods: 2.5 hours

Laboratory periods: 0 hours

Recitation periods: 0 hours

Course Description:

This course introduces the techniques and problems of Financial Risk Management and Asset Pricing. It emphasizes risk finance and attitudes; Value at Risk; risk measurement principles; valuation and expected utility and their relevance in the valuation and the pricing of financial investments; insurance; management of derivatives; and risk management. Throughout, risk-management application problems are explored. The course introduces and focuses on the fundamental principles of the Arrow-Debreu state preference theory used to price derivatives and other assets in complete markets. Risk neutral-Binomial models in option pricing; essential elements of Ito calculus; and the Black-Scholes model for pricing options are introduced and applied to practical financial decision making and risk management problems. Prerequisite: Graduate Standing

Course Structure

This course will be delivered through a series of lectures, followed by a question and answer session and a discussion.

Readings

A set of notes and a list of recommended books and articles will be distributed weekly through NYU classes. In addition, there are two mandatory textbooks for this course:

1. GARP:
 - a. Market Risk;
 - b. Credit Risk ;
 - c. Operational Risk
 - d. ALM
2. Jon Gregory, *Counterparty Credit Risk, The New Challenge for Global Financial Markets*,
3. Don M. Chance, Robert Brooks: *An Introduction to Derivatives and Risk management* (8th Edition)

Course requirements

Students will be expected to read materials ahead of course meetings to participate actively in class and also be prepared to discuss assignments in class. They are also required to hand weekly Homework assignments in.

Grading:

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| 10% | Homework (weekly assignments) |
| 40% | Midterm Examination, October 25 th , 2018 |
| 50% | Final Examination, December 20 th 2018 |

Syllabus

Market Risk Measurement and Management

- Risk on Single Instrument; Duration and convexity; Key rate duration
- Stock risk and beta value
- Option risk: Delta; Vega; Gamma; Theta; Rho
- Volatility and Correlation
- Assumptions using volatilities and correlations
 - Simple Moving Average Exponentially Weighted Moving Average (EWMA)
 - GARCH-methods
- Value at Risk and Expected Shortfall

Credit Risk Measurement and Management

Operational Risk Management including Model Risk

Bank Capital Management

- Enterprise Risk Management (ERM) ; Asset Liability Management
- Risk-adjusted return on capital (RAROC)

Risk Management for the Buy Side

Risk Management for Nonfinancial Corporations

If you are student with a disability who is requesting accommodations, please contact New York University's Moses Center for Students with Disabilities at 212-998-4980 or mosescsd@nyu.edu. You must be registered with CSD to receive accommodations. Information about the Moses Center can be found at www.nyu.edu/csd. The Moses Center is located at 726 Broadway on the 2nd floor.