NYU Tandon School of Engineering
Department of Finance and Risk Engineering
Course Outline FRE-GY 6073 Introduction to Derivative Securities
Fall 2025
Professor Shonali Gupta

Professor Contact: shonali.gupta@nyu.edu
Office hours: By appointment, available by email

Course Pre-requisites
Matriculation into MS Financial Engineering or permission of the FRE Department.

Course Description
For each of the four fundamental derivatives, futures, forwards, swaps and options, this course covers in detail associated definitions, terminology, market mechanics, theoretical fair value pricing and provides numerous practical examples of derivative strategies used in today's markets.

Course Objectives
Students should expect to achieve a detailed understanding of the following

- An analytical and intuitive understanding of derivative applications useful in employment interviews
- A clear understanding of definitions and terminology specific to each of the four fundamental types of derivative contracts (futures, forwards, swaps and options)
- A practical knowledge of how contracts are quoted and traded in their respective markets
- How to derive and compute the theoretical fair values for each of the fundamental contracts
- Practical examples of how derivatives are applied to solve current industry problems arising in hedging, investing, trading, and issuing

Course Structure
In the first several lectures we focus on futures and forward contracts on equity and interest rates. Definitions, terminology, users and uses are covered. Market mechanics and fair value pricing of futures and forward through arbitrage are explained. Current industry applications are illustrated in detail along with the global transition to alternative IBOR rates.

Details of swaps are addressed in several following lectures with special attention given to interest rate swaps. Caps, Floors and Swaptions are explained. Application examples illustrate industry usage.

Options are addressed in the final set of lectures. Option basics, modeling, fair value pricing, valuation and option Greeks are explained, and practical applications are emphasized. The Wiener process and the derivation of the Black Scholes pricing formula will be covered. A Midterm Exam will be administered on the seventh lecture date and a Final Exam on the last lecture date. Four assignments will be given through the semester. Course announcements will be on Brightspace.

There may be one or two guest lectures arranged with industry experts. Participation in these guest lectures is expected and will count towards the final grade. The grading breakdown is provided below.

Readings
The text for the course is: John C. Hull, Options, Futures and Other Derivatives
Available in the NYU Bookstore and at the Dibner Library.

Grading

- 35% Midterm Exam
- 35% Final Exam
- 20% Assignments
- 5% Attendance at guest lectures
- 5% Thoughtful class participation and Class attendance

Exams
Midterm and End term exams will be closed book. You may bring a calculator.

NYU Policies

Inclusion Statement

The NYU Tandon School values an inclusive and equitable environment for all our students. I hope to foster a sense of community in this class and consider it a place where individuals of all backgrounds, beliefs, ethnicities, national origins, gender identities, sexual orientations, religious and political affiliations, and abilities will be treated with respect. It is my intent that all students' learning needs be addressed both in and out of class, and that the diversity that students bring to this class be viewed as a resource, strength and benefit. If this standard is not being upheld, please feel free to speak with me.

Moses Center Statement of Disability

If you are student with a disability who is requesting accommodations, please contact New York University's Moses Center for Students with Disabilities (CSD) 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 3rd floor.

NYU School of Engineering Policies and Procedures on Academic Misconduct

A. Introduction: The School of Engineering encourages academic excellence in an environment that promotes honesty, integrity, and fairness, and students at the School of Engineering are expected to exhibit those qualities in their academic work. It is through the process of submitting their own work and receiving honest feedback on that work that students may progress academically. Any act of academic dishonesty is seen as an attack upon the School and will not be tolerated. Furthermore, those who breach the School's rules on academic integrity will be sanctioned under this Policy. Students are responsible for familiarizing themselves with the School's Policy on Academic Misconduct.

B. Definition: Academic dishonesty may include misrepresentation, deception, dishonesty, or any act of falsification committed by a student to influence a grade or other academic evaluation. Academic dishonesty also includes intentionally damaging the academic work of others or assisting other students in acts of dishonesty. Common examples of academically dishonest behavior include, but are not limited to, the following:
   a. Cheating: intentionally using or attempting to use unauthorized notes, books, electronic media, or electronic communications in an exam; talking with fellow students or looking at another person's work during an exam; submitting work prepared in advance for an in-class examination; having someone take an exam for you or taking an exam for someone else; violating other rules governing the administration of examinations.
   b. Fabrication: including but not limited to, falsifying experimental data and/or citations.
   c. Plagiarism: intentionally or knowingly representing the words or ideas of another as one's own in any academic exercise; failure to attribute direct quotations, paraphrases, or borrowed facts or information.
   d. Unauthorized collaboration: working together on work that was meant to be done individually.
   e. Duplicating work: presenting for grading the same work for more than one project or in more than one class, unless express and prior permission has been received from the course instructor(s) or research adviser involved.
   f. Forgery: altering any academic document, including, but not limited to, academic records, admissions materials, or medical excuses.

If you are experiencing an illness or any other situation that might affect your academic performance in a class, please email Deanna Rayment, Coordinator of Student Advocacy, Compliance and Student Affairs: deanna.rayment@nyu.edu. Deanna can reach out to your instructors on your behalf when warranted