Course Syllabus – Valuation and Financial Engineering FRE-UY 2503

David C. Shimko, Industry Full Professor of Financial Engineering, Fall 2026

Instructor email: david.shimko@nyu.edu
Office: 1 Metrotech, 10th Floor
Office hours: Thursday 2:00-4:00 p.m.
(Please direct homework questions to TAs)
By Zoom appointment, or in-person appt
Location/Time:

Teaching Assistant(s):

This course introduces mathematically qualified students to the foundations of modern finance and financial engineering. Coverage includes cash flow valuation, portfolio-based valuation, Modern Portfolio Theory, the Capital Asset Pricing Model, futures, options, and selected complex financial products. Students should expect to gain a broad understanding of financial concepts and applications, one suitable as preparation for advanced study or financial internships.

Prerequisites

- Multivariate calculus
- Computational linear algebra. Solving basic matrix equations.

Skills learned in this class

- Introductory exposure to financial markets and institutions
- Microsoft Excel (advanced financial modeling)
- Asset valuation
- Derivatives valuation: Futures, European options, exotic options
- Monte Carlo simulation methods
- MPT and CAPM (see below)
- Financial engineering applications

Textbook:

Mathematics for Finance: An Introduction to Financial Engineering, 2ed.
Marek Capinski and Tomasz Zastawniak
Springer Undergraduate Mathematics Series, 2010
Available on amazon.com for about $25 (make sure to get the second edition)
We will also use some printed materials from the MSFE valuation class where appropriate.

Instructor information:

Prof David C. Shimko

Resume in brief:

- Assistant Professor, Marshall School, USC
- Adjunct Professor, Harvard Business School
- Adjunct Professor, NYU Courant
- Head of Commodity Derivatives Research, JPMorgan
- Head of Credit Research, JPMorgan
- Head of Risk Management Advisory, Bankers Trust
- CEO and co-founder of Risk Capital, an independent risk advisory firm
- CEO and co-founder of CreditCircle, a marketplace lending platform
- Director of public, private and non-profit entities including GARP
- Widely published in derivatives valuation, risk management, commodities and credit
- Currently Industry Full Professor of Financial Engineering, FRE Department, NYU Tandon
- Scholar, www.wallstreetscholars.com
- Father of five, grandfather of seven

Class organization:

Brightspace: Please follow the course requirements and announcements online weekly, as they are likely to change as the term progresses.

Recommended calculators: You may use any calculator. You may also use a smart phone app. Please bring a working version of Excel to class. You should install the add-ins for SOLVER and DATA ANALYSIS. I highly recommend you take an online course in Excel basics prior to class. I will cover advanced applications in class.

Recommended analytic software: I prefer Excel, not for its elegance or ease of use, but for the ease of collaboration and visualization with colleagues, supervisors and clients. **You must have access to Excel to complete your assignments.** You have the option to use Python for completing more complex projects.

Course grading: Brightspace may assign grades to you based on 90/80/70/60 gradeschool-style scoring. PLEASE IGNORE ANY GRADES GIVEN BY BRIGHTSPACE! All grading in this class is on a curve.

Missed class policy: I do not take responsibility for your missed classes. You are not penalized for missing classes, however, your participation grade may suffer. If you must miss a class, be sure to study the powerpoint presentation and any sample spreadsheets from that week.

Office hours: TA hours TBA on Brightspace. Please consult TAs first for help with assignments and projects. Prof Shimko is available for other matters in-person Thursday 2-4 p.m. or Zoom appointment. Email: david.shimko@nyu.edu.

Class outline, subject to revisions

Course outline by week

1	Present value of risk-free cash flows. Valuation of cash flow sequences.
2	Financial decision-making using risk-free valuation methods.
3	Present value of risky cash flows.
4	Portfolio-based valuation models. Lintner's CAPM.
5	Modern Portfolio Theory (MPT): Closed form and practice.
6	Capital Asset Pricing Model. Sharpe's CAPM.
7	Class miniproject. Prepare for midterm.
8	Midterm one hour. Discussion and resolution of questions and answers.
9	Financial futures contracts. Mechanics, pricing, speculation and risk management.
10	Commodity futures contracts. Unique pricing and risk issues associated with commodity contracts.
11	European option valuation using integration, numerical integration and simulation. No stochastic calculus.
12	Valuation of complex derivative contracts. American options, Asian options and spread options.
13	Financial engineering – corporate examples.
14	Final exam one hour. Discussion and grading.

Grading

20% of your class grade is based on class participation. This is my subjective determination of the quality of your participation in class. This includes your questions and your answers during class and with the TA, and other communications by email or in person. It is ok to be incorrect sometimes, as this is a necessary part of learning.

20% of your class grade is based on homework assignments. These are graded by the TA. You may use an LLM to assist if needed, but you may need to show your work and solutions to get full credit.

20% of your class grade is based on mini projects. We will have two miniprojects. Each miniproject can be shared by two students, but the partner must change for the second project.

40% of your class grade is based on exams. Equal weight to the midterm and final.

All scores will be aggregated, scaled and reported on a scale of 0-100. The curve is not predetermined.

Policies

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:

1. 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.
2. Fabrication: including but not limited to, falsifying experimental data and/or citations.
3. 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.
4. Unauthorized collaboration: working together on work that was meant to be done individually.
5. Duplicating work: presenting for grading the same work for more than one project or in more than one class, unless express and prior permission have been received from the course instructor(s) or research adviser involved.
6. Forgery: altering any academic document, including, but not limited to, academic records, admissions materials, or medical excuses.

Disability Disclosure Statement

Academic accommodations are available for students with disabilities. Please contact the **Moses Center for Students with Disabilities** (212-998-4980 or mosescsd@nyu.edu) for further information. Students who are requesting academic accommodations are advised to reach out to the Moses Center as early as possible in the semester for assistance.

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.