

FRE-GY.5010 - Summer 2021 Bootcamp Syllabus*

*Subject to minor changes

As of April 21, 2021

Professor David C. Shimko, david.shimko@nyu.edu

Department of Finance and Risk Engineering

Overview

Although the online bootcamp is not graded, the material covered is mandatory for the FRE program. Instructors during the regular FRE class sessions in the Fall Semester will expect you to have this background knowledge. The first half of the course is dedicated to financial markets and financial institutions. The second half of the course is a review of advanced mathematical topics which are considered prerequisites for FRE classes. All students should attend the final session in order to be graded and ranked. There is no penalty for missing any class if you determine you have already studied and mastered the material elsewhere.

Required student preparation in advance of online course:

- Your personal laptop must be loaded with Excel. Install the **Data Analysis** and **Solver** add-ins.
- Purchase the texts for the online course, or identify alternative sources from your previous study.
- You may load your computer with free downloads of Python, Anaconda and Jupyter Notebook prior to class, and start writing simple programs in preparation for the onsite bootcamp programs.

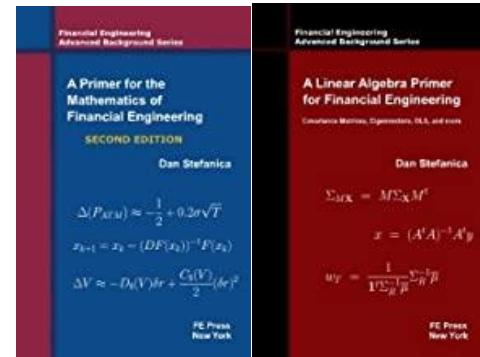
Textbooks and Online Materials:

Online portion, 5/25/20 – 7/8/20, Tuesdays and Thursdays 8:00-10:00 a.m. New York time

- **Guide to Financial Markets, The Economist**, 6th Edition (Free PDF available at https://media.economist.com/sites/default/files/pdfs/Guide_to_Financial_Markets_6e.pdf)

Highly recommended texts (text and solutions available online for purchase):

- **A Primer for the Mathematics of Financial Engineering, Second Edition (Financial Engineering Advanced Background Series)**, by Dan Stefanica
- **A Linear Algebra Primer for Financial Engineering: Covariance Matrices, Eigenvectors, OLS, and more (Financial Engineering Advanced Background Series)**, by Dan Stefanica



List of Dates and Topics (2 hour lectures)

You should prepare for each lecture by trying the sample questions and exercises BEFORE class. This will help make you aware of any gaps in your knowledge of the topics each day. You are also responsible for viewing any announcements that may be made prior to each class.

#	Date	Topic: Subtopic
1	5/25	Markets: Money & foreign exchange (The Economist : Ch 1-2)
2	5/27	Markets: Fixed income markets (Ch 3-4)
3	6/1	Markets: Corporations and equity (Ch 7)
4	6/3	Markets: Exchange-traded derivatives (Ch 8-9)
5	6/8	Markets: Financial institutions
6	6/10	Markets: Innovation and structuring
7	6/15	Calculus: Differentiation and integration, analytic and numerical
8	6/17	Calculus: Constrained optimization, numerical methods
9	6/22	Linear Algebra: Basics, matrices, matrix operations
10	6/24	Linear Algebra: Regression and inference
11	6/29	Differential Equations: Analytic solutions
12	7/1	Probability: The Gaussian (normal) and related distributions
13	7/6	Statistics: Hypothesis testing
14	7/8	Timed exam for certificate

Homework assignments will be turned in on Brightspace before the following class begins.

Evaluations

Scoring for the class will be based on the higher of

- 50% on the final exam and 50% on homework
- 100% on the final exam
- All students will receive a passing grade on their transcript regardless of their score; there are no letter grades.

Students are responsible for following the NYU Tandon code of conduct, which may be found by searching this term:

[NYU Tandon Student Code of Conduct_04.03.19_1.pdf](#)

The NYU Tandon Inclusion Policy

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.