NYU TANDON SCHOOL OF ENGINEERING
Finance & Risk Engineering

FRE-GY 7043
Financial Engineering Capstone: Project
3.00 credits
Section: Industry project

Instructor Information

- Professor Agnes Tourin
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- Professor Francisco Rubio
  - Office hours: by appointment via zoom
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Course Information

- This course is currently offered in the fall, spring, and summer semesters (note that the duration of the fall and spring semesters is 14 weeks, whereas the summer semester is 12 weeks long.
- Specific projects are proposed by companies in the financial industry.
- In this project course, students work on a project under the supervision of a company's employee and the course's instructor. However, the course is intended to be largely self-directed within the guidelines established by the supervising faculty member. Depending on the particular project, students will either work individually or in a team. The main deliverable will typically be a software product or a conclusion drawn from data analysis. A significant written component is also required.
- Meetings with the company's employee: weekly (usually remote)
- Meetings with the course's instructors: weekly

Prerequisites:

This course should be taken after the student has successfully completed two semesters and has earned at least 18 credits. Note that students may only register once for this course.

Course Overview and Goals

The topics covered are varied, ranging from classical portfolio and risk management to trading strategies and execution, or the analysis of alternative financial data. Students will be given the opportunity to practice applying the techniques they learned in the m.s. Program in Financial Engineering, such as quantitative modeling, econometrics, and machine learning.

Upon Completion of this Course, students will

- be able to solve industrial problems in Finance by setting up data pipelines, cleaning, visualizing, and analyzing data, designing new quantitative methods and models, developing algorithms and software products or enhancing existing ones.
- have gained expertise in a specific industrial application of Financial Engineering.

Course Requirements

- Students are required to submit a research report on the last day of classes, both to their industry advisor and the course instructors through Brightspace.
- In addition, students will be required to produce an outline of their research report by the middle of the semester (end of week 7).

Grading of Assignments

The students will be evaluated on the quality of the written project report. The report should follow the structure of an academic research paper, including an abstract, introduction, a literature review, a description of the methodology and data, a presentation and analysis of the results accompanied by an account of findings, an acknowledgment of the limitations and weaknesses of the approach, and recommendations (if applicable), a conclusion, a list of references, figures and tables, and appendices.

The instructors will primarily assess the following components:

- The originality and significance of the contribution
- The rigor of the methodology
- The reproducibility of the work (there should not be any gap in the description of the method)
- The structure and clarity of the report
- The quality of the language
- Whether the conclusions are supported by the results
- Whether the introduction adequately situates the work by motivating it and highlighting the authors' novel contributions to the existing literature or current industry practices.
- Whether the references are appropriately cited in the text.

The grade for this course will be determined according to the following formula:

Activities/assignments	% grade
Midterm outline	25%
Final research report	75%
Weekly meetings with instructors	0%
Weekly meetings with Industry host	0%

The grades will be posted on NYU Brightspace.

Final Grade

This course will be graded with a letter grade. Letter grades for the entire course will be assigned as follows:

Letter Grade	Points	Percent
A	4.00	95% and higher

A-	3.67	90.0 – 94.99%
B+	3.33	87% - 89.99%
B	3.00	83% - 86.99%
B-	2.67	80% - 82.49%
C+	2.33	77% - 79.99%
C	2.00	70.0% - 76.99%
F	.00	69.99% and lower

View Grades

- Grades will be posted under Grades on the NYU Brightspace site for this course as soon as they are available.

Course Materials: none.

Resources

- **Access your course materials**:NYU Brightspace
- **Databases, journal articles, and more**: Bern Dibner Library (library.nyu.edu) NYU Virtual Business Library (guides.nyu.edu/vbl)
- ***Requesting GPUS from the High Performance Computing (HPC) resource*** *https://www.nyu.edu/life/information-technology/research-computing-services/hig h-performance-computing.html*

  - Go to NYU Identity Management Service (use the VPN if off campus) and request the GPUs from there: From the main menu in the top left corner, go to *manage access* and then to *Request HPC Account*.
  - In general, only teaching dedicated GPUs are allowed (funded research has priority over capstone projects).
- **NYU Colab:** It is part of the NYU google suite.
- **NYU Generative AI:**
  - **Google Gemini and Google Notebook LM:** They are part of the NYU google suite.
  - **NYU Private GenAI service:** it requires University approval. Any information entered into the NYU Private GenAI model is governed by NYU's data privacy policy.
- **Overleaf:** it is an online latex solution. You can log in Overleaf with NYU SSO.
- ***Bloomberg* stations** *(FRE students subscription)*
  - *Excel Api*
  - *Bloomberg python blpapi combined with the third party blp which helps manage the connection (tune the parameters)*
  - *Blpapi is a single-thread API: you can only download one stock ticker at a time until you reach your quota.*
  - *We do not know what our quota is*
  - *We do not have the bipipe (unlimited connection)*
- ***WRDS (Wharton Research Data Services)****: access must be requested from NYU. See Account Registration: Step-By-Step Directions*
- ***Other data sources: Github* (***private data repositories****), Yahoo Finance***
- **Obtain 24/7 technology assistance:** Tandon IT Help Desk (soehelpdesk@nyu.edu, 646.997.3123)
  NYU IT Service Desk (AskIT@nyu.edu, 212-998-3333

Policies

NYU Tandon Policies and Procedures on Academic Misconduct

The complete policy can be found here.

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 has 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.

Generative AI policy for this course

This policy was adapted from the NYU page **(**https://www.nyu.edu/faculty/teaching-and-learning-resources/Student-Learning-with-Generative-AI.html**)**

- You are encouraged to use Generative AI as a learning tool.
- You must document your process and use of Generative AI if you are using Generative AI
- You must still apply and develop your critical and creative thinking while using AI. You should always **independently verify and check** the output produced by AI.
- You **may not** simply copy and paste the output generated by an AI. Also just rephrasing an AI-generated output is **not enough** for it to be considered your own work!

Disability Disclosure Statement

Students requesting academic accommodations are advised to reach out to the Moses Center for Student Accessibility (CSA) as early as possible in the semester for assistance.

Henry and Lucy Moses Center for Student Accessibility
Telephone: 212-998-4980
Website: https://www.nyu.edu/csa
Email: mosescsa@nyu.edu