NYU TANDON SCHOOL OF ENGINEERING
Finance & Risk Engineering

FRE-GY 7773
Spring 2026 – Machine Learning in Financial Engineering

Instructor Information

- Florian Bourgey, Adjunct Professor
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Course Information

- This class meets every Thursday from 11:00 AM to 1:30 PM

Course Overview and Goals

This course provides a hands-on introduction to fundamental machine learning concepts and techniques, with a focus on applications in the financial industry. Each lecture is accompanied by a Jupyter notebook featuring a concrete financial application, allowing students to implement and experiment with the algorithms discussed in class. By the end of the course, students will have gained practical programming experience and developed the machine learning skills necessary to apply these methods effectively in their professional work.

Course Program

1. Introduction to Machine Learning and Python for Finance (Weeks 1-2)
2. Supervised Learning: Regression Methods (Weeks 3-4)
3. Supervised Learning: Classification Methods (Weeks 5-6)
4. Unsupervised Learning and Dimensionality Reduction (Weeks 7-9)
5. Time Series Modeling (Weeks 10-11)
6. Neural Networks and Deep Learning (Weeks 12-14)

Course Assessment

Student evaluation will be based on three components: homework assignments and quizzes (30%), a group project (30%), and a final exam (40%). The final exam will be held at the end of the semester.

Course Materials

Required Textbooks & Materials

- Bishop, C. M. (2006). Pattern Recognition and Machine Learning. Springer.
- Hastie, T., Tibshirani, R., & Friedman, J. (2009). The Elements of Statistical Learning: Data Mining, Inference, and Prediction (2nd ed.). Springer. • VanderPlas, J. (2016).
- Python Data Science Handbook. O'Reilly Media. Available at https://jakevdp.github.io/PythonDataScienceHandbook/
- Zhang, A., Lipton, Z. C., Li, M., & Smola, A. J. (2023).
- Dive into Deep Learning. Available at https://d2l.ai/.
- Géron, A. (2019). Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow: Concepts, Tools, and Techniques to Build Intelligent Systems. O'Reilly Media.

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)
- **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

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. If this standard is not being upheld, please feel free to speak with me.

Using Generative AI

Please refer to the Adapting Assignments to Generative AI page to craft a statement that is either Integrating, Avoiding, or Forbidding.