CISC 5352 Financial Programming and Applications

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Office hours: W 4:30 pm-6:00 pm or by appointment.

Course Objectives

- This course aims to fostering and enhancing students' data analytics and software development capabilities in finance.
- After taking this class, students should be able to conduct state-of-the-art financial data analytics by implementing complicate financial models, trading algorithms and conducting related software development.

Course prerequisites

- This course assumes students have basic programming knowledge in C++ or equivalent.
- Graduate students should take CISC5350 and undergraduate students should successfully complete CISC2000

Text

- *High-Frequency Trading: A Practical Guide to Algorithmic Strategies and Trading Systems,* 2nd Edition, 2013 by Irene Aldridge, WILEY (*reference*)
- *Python for Finance: Analyze Big Financial Data, 2013* (*reference)*
- *Option Pricing Formulas*, 2nd Edition, 2006 by Haug, McGraw-Hill (*reference)*

Homework

- There are 5-7 homework assignments.
- Each homework should be clearly typed. Paper-pencil based homework solution will not be accepted.
- Your homework should consist of *workable codes* and corresponding running results, in addition to typing related problem solutions or question answers.

- Each student or group should submit their homework/project via *blackboard* system, in addition to turning in a hardcopy.

Quizzes

- There are weekly-based quizzes.
- Each quiz mainly focuses on basic materials covered in the previous class
- Some quizzes may require you to do problem-solving by programming

Projects

- There are three large programming projects. At least one project will be a team project.
- The projects mainly focus on real-world Quant problem solving or related topics.
- Each team will be required to present their projects in class, if the project is a group project.

Grading

The grading will be based on the following weighted 100 points.

- Homework: 20%
- Quizzes: 15%
- Projects: 20%
- Midterm: 15%
- Final: 20%

Topics to be covered

- Introduction to financial programming (I,II)
- State-of-the-art financial models
- High-frequency trading (HFT)
- Machine learning methods in HFT
- Statistical arbitrary strategies
- Post-trade profitability analysis
- Financial big data analysis (TAQ)
- Other topics

Course Web

- The course homepage can be accessed through *blackboard* in your *my.fordham* account.
- All lecture notes, homework, projects, and related materials will be posted there.

Course Policy

- Every student is required to attend each class/lecture meeting. If you have to miss a class for some reason, please let your instructor know in advance by email, phone call, or other ways.
- There is no make-up for quizzes. Late homework/project will not be accepted unless there is an acceptable reason.
- Discussion for homework/project assignments is encouraged. However, each student should turn in their own *independent work*. Copying codes and answers from Internet or other resources in homework and projects will be counted as cheating.
- No discussion for take-home quizzes.
- I will give some extra credit problems in homework, projects, and exams.

Miscellaneous

- Please let your instructor know if you have a disability that requires special arrangements.
  - Under the Americans with Disabilities Act and Section 504 of the Vocational Rehabilitation Act of 1973, all students, with or without disabilities, are entitled to equal access to the programs and activities of Fordham University. If you believe that you have a disability that may interfere with your ability to participate in the activities, coursework, or assessment of the object of this course, you may be entitled to accommodations. Please schedule a meeting to speak with someone at the Office of Disability Services (Rose Hill - O'Hare Hall, Lower Level, x0655 or at Lincoln Center – Room 207, x6282).
- The main office of the Department of Computer and Information Science is in JMH 340 (Phone: 718-817-4480).
- CIS department Computer Labs: LL 812.