FINC 305: Financial Modeling
Easter Semester 2025
Course Syllabus

Professor: Dr. Linxian Huang
Class Schedule: TR 8:00 AM - 9:15 AM at Walsh-Ellett Hall 202
Contact Email: lihuang@sewanee.edu

No textbook is required. However, since this is a coding-intensive class, I recommend bringing a laptop to class for any potential needs.

Office Hours: Wednesday at 11:30 AM - 1:30 PM at Carnegie Hall 216. Other times are also available by appointment

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Course Description
This course emphasizes using financial data to analyze and predict financial assets and investment portfolio risks and returns. Students will integrate core knowledge of statistics and econometrics to apply traditional financial models, including linear regression, time series analysis, logistic regression, and portfolio optimization, to make data-driven investment decisions.
In addition to integrating these established methodologies, students will also learn to create their own financial models based on individual insights and objectives. They will explore simulation techniques to assess the performance and robustness of their models under various scenarios. This course is designed for students eager to explore the intersection of financial data and modeling, providing both theoretical foundations and practical applications, and preparing students for careers in Investment Banking, Quantitative Modeling, Asset Management, and Data Science.

Financial Analysis: Programming in Python
You will use Jupyter Notebook to learn Python and to study financial analysis techniques. **It is required** for all coursework, including lectures, homework, projects, and exams. All analysis work should be conducted with Python. You can download Anaconda from anaconda.com.

Attendance
Attendance is essential for your success in this course. Regular attendance allows you to engage fully with the material and stay updated on important announcements about exams, assignments, and quizzes. If you miss a class, it is your responsibility to gather the missed information from classmates, email updates, or Brightspace (not from me). Attendance will be taken in every class. Although low attendance does not result in a penalty, **students with fewer than five unexcused absences will have their final grade rounded up by as much as 1%.** For instance, if your final grade is 89% and you have fewer than five unexcused absences, your grade will be rounded up to 90% (A-). (An 88.9% will not qualify under this policy.)

An excused absence is defined as providing a valid reason for your absence **before class** via email or with appropriate documentation.

Assessment and grading

Grading Scheme:

Basic Components: 100%

What	When	Weight
Assignments	To be announced in class	10%
In-Class Practice	To be announced in class	10%
Quiz	To be announced in class	10%
Term Project	See syllabus	25%
Exam 1	Linear Regression	15%
Exam 2	Time-Series	15%
Exam 3	Simulations	15%
Final Exam	No final exam!	0%

Extra Credit: 5%

What	Weight
Class Participation	5%

Grading Scale:

Grade	Percentage (%)
A+	98 – 100
A	94 – 97.999
A -	90 – 93.999
B +	86 – 89.999
B	82 – 85.999
B -	78 – 81.999
C +	75 – 77.999
C	70 – 74.999
C -	66 – 69.999
D +	64 – 65.999
D	62 – 63.999
D -	60 – 61.999
F	< 60

Assignments (10%)
I will assign three or four assignments (tentative) for this course; each assignment can be treated as a mock exam for each section. The due date will be announced when the assignment is released on Brightspace, and **you should submit the assignment on Brightspace in the "Assignments" section.** The answer will be released when the assignment is due.

Late Submission Policy: To account for potential technical issues, **assignments submitted within 10 minutes after the deadline will not incur any penalties.** However, submissions received after this 10-minute grace period will be **penalized 15% of the grade per 24 hours late.** The final grade for late submissions will be calculated as follows:

$$\text{Final Grade} = \text{Performance} \times (100\% - 15\% \times \text{Late Submission Days})$$

If you anticipate needing to submit late due to any circumstances, please communicate with me **before the deadline** and provide appropriate documentation, such as athlete schedules, doctor's notes, or other relevant proof. I will accommodate requests based on the specifics of the situation.

In-class Practices (10%)
I will assign several in-class practice questions for almost every class, and most results and codes will be covered and discussed during class. After finishing each section, I will collect the Jupyter notebooks or other works, grade them, and provide feedback. The due date will be announced one class in advance, and **all submissions should be made on BrightSpace.** Complete answers will be released when I finish grading. **In-class practice follows the same late submission policy for assignments.**

Quizzes (15%)
There will be **three (3) in-class quizzes (tentative)** throughout the semester for each section, with quiz times announced one week in advance. You will have **35 minutes** to complete each quiz, which may include both conceptual and calculation-related questions. You are not allowed to bring formula sheets; however, I will provide some formulas for the quiz questions. Make-up quizzes will be given at the professor's discretion and only under extraordinary circumstances. More information will be announced in class when the quiz is released.

Exams (45% total)
Three exams will be given for this course, and each exam will constitute 15% of your final grade. Exams will be **open-source programming set-up**. There will be no makeup exam unless you have a compelling reason (i.e., illness, athletic events, etc.) for missing an exam, in which case valid documentation (i.e., doctor's notes in the case of illness, event schedule with coach signature, etc.) needs to be presented and approved by the professor at least 24 hours before the exam date. **An unexcused absence from an exam will result in a grade of zero.**

Materials Tested: Materials covered in each exam will be announced in class one week before the exam date. The three exams are **not cumulative**. Exam questions are drawn from the lectures, in-class practice, and assignments. Any code is welcome to solve problems and is not limited to the methods we discussed in class.

Open-source programming: You are allowed to use course materials (Jupyter Notebook only), open-source example codes online, or others to help you finish the exam. **However, ChatGPT, Copilot, or any AI tools and AI-generated code are not allowed.**

Term project (25%)

Using the knowledge gained in class, the term project provides an efficient way to connect with the real world alongside your classmates. You may form your own team, but there can be a maximum of four members (I expect 3 or 4 students in each group). Every team must apply the methodologies we've learned in class and gather data from open sources for the term project. Each team can choose its preferred securities or create a specific portfolio to perform financial analysis, including factor models, time-series analysis and forecasting, VaR estimation, and relative simulations. Additionally, each team will construct a final presentation in class to detail its findings and share thoughts on potential trading strategies. Team members should contribute equally to the project; failure to do so will result in differing grades among group members.

Important dates, grades, and deliverables (tentative):

- 1/23 (Thursday, 5%): Pick teammates and specific stock/portfolio for analysis
- 2/13 (Thursday, 15%): Factor model estimation
- 3/05 (Wednesday 15%): Time-series analysis
- 3/28 (Thursday 15%): Time-series forecasting
- 4/11 (Thursday, 15%): VaR with Monte Carlo Simulation
- 4/25 (Thursday, 15%): Stress testing and scenario analysis (Tentative)
- 4/29 (Tuesday, 20%): Final presentation (10%) and report submission (10%)

  Note: If we don't have time to present stress testing and scenario analysis due to time constraints, the weight of the final presentation and report submission will change to 20% and 15%, respectively (total is 35%).

Extra Credit: Class Participation (5%)

You have three ways to get extra credit based on class participation, and you can get at most 5% extra in your final grade:

1. *In-class participation.* Students who can correctly solve the advanced problems I may post on the board or actively engage in in-class discussion will **get 1% extra credit in the final grade.**
2. *Bonus Assignments:* Students who correctly complete the bonus assignment that I may post on BrightSpace or announce in class will receive an additional **2% extra credit toward their final grade.** (Expected one or two assignments in a semester)
3. *Attendance in some classes.* Students who show up in some low-attendance classes can **get 1% extra credit in the final grade.**

Honor Code

As with your other courses at Sewanee, the honor code is in effect for homework assignments, essays, and exams in this course. Students need to do their own honest work and not to cheat in any form. All forms of cheating, including plagiarism, are violations of the Honor Code and will be treated as such. As per the Honor

Code, plagiarism is defined as "**copying or imitating** the language and thoughts of others and **passing** the result off as an original work." Using the language or ideas of others without proper citation is considered academic dishonesty (cheating), and "others" includes responses from artificial intelligence processing programs **(for example, ChatGPT)**. If you ever have a question about an assignment or need additional help, please ask for assistance rather than jeopardize your academic career. If you need to re-familiarize yourself with the honor code, it can be found at:
http://www.sewanee.edu/academics/about/the-honor-code/.

The Writing Center
The Writing Center, located on the main floor of duPont Library, provides objective peer support to Sewanee students who seek assistance with their writing projects. The student tutors can help at any stage in the writing process, including topic development, rough drafts, final drafts, and revisions. You may schedule an appointment in our online platform (https://sewanee.mywconline.com/)
or see our website (https://www.sewanee.edu/writingcenter/) for more information.

ADA Statement
The University of the South is committed to fostering respect for the diversity of the University community and the individual rights of each member of that community. In this spirit, and in accordance with the provisions of Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act (ADA), the University seeks to provide students with disabilities with the reasonable accommodations needed to ensure equal access to the programs and activities of the University.

Any student with a documented disability needing academic adjustments is requested to speak with Student Accessibility Services (SAS) as early in the semester as possible. If approved for accommodations, the student has the responsibility to present their instructors with a copy of the official letter of academic accommodations. Please note: Accommodation letters should be dated for the current term; accommodations will not be provided without a current accommodation letter, and accommodations cannot be applied retroactively.

SAS is located in the Office of the Dean of Students (931.598.1229). Additional information about accommodations can be found at:

https://new.sewanee.edu/campus-life/playing/wellness commons/university-wellness-center/student-accessibility-services/

Students who have questions about physical accessibility should inform their instructors so that we can ensure an accessible, safe, and effective environment.

Title IX and Sex Discrimination Policy:
Sex Discrimination is a violation of federal Title IX law and University policy. Disclosure of sex discrimination to University faculty, staff, or student leaders (i.e. proctors, Orientation Leaders, FYP mentors) is not confidential and these individuals are required to make reports, including names and circumstances, to the University's Title IX Coordinator. To report incidents of sex discrimination, including sexual violence, stalking, and/or sexual harassment, please file a report at
ReportSexualMisconduct.sewanee.edu or contact the Title IX Coordinator (Dr. Sylvia Gray, titleix@sewanee.edu, Woods Lab 138, 931-598-1420). For more information on Title IX, the Title Policy and Procedure, related policies such as mandatory reporting, or resources for support and confidential disclosure, please refer to the Title IX website: new.sewanee.edu/titleix.

FINC 305 Outline (Tentative)

Class	Description
1 (01/14, T)	Course Introduction and Motivation
2 (01/16, R)	Review: Linear Algebra and Foundation of Python
3 (01/21, T)	Review: Foundation of Python
4 (01/23, R)	Linear Regression I (Theory)
5 (01/28, T)	Linear Regression II (Application)
6 (01/30, R)	Linear Regression III (Application)
7 (02/04, T)	Linear Regression IV (Application)
8 (02/06, R)	Linear Regression V (Application)
9 (02/11, T)	Time-Series Analysis I (Theory)
10 (02/13, R)	Review of Exam 1
11 (02/18, T)	In-class Exam 1: Linear Regression
12 (02/20, R)	Time-Series Analysis II (Theory and Application)
13 (02/25, T)	Time-Series Analysis III (Application)
14 (02/27, R)	Time-Series Analysis IV (Application)
15 (03/04, T)	Time-Series Analysis V (Application)
Spring Break	
16 (03/18, T)	Intro of VaR, ARCH and GARCH (Theory)
17 (03/20, R)	Simulation I (Theory and Application)
18 (03/25, T)	Review of Exam 2: Time-series
19 (03/27, R)	In-class Exam 2: Time-series
20 (04/01, T)	Simulation II (Application)
21 (04/03, R)	Simulation III (Application)
22 (04/08, T)	Simulation IV (Application)

23 (04/10, R)	Simulation V (Application)
24 (04/15, T)	Logistic Regression I (Theory and Application)
25 (04/17, R)	Logistic Regression II (Application)
26 (04/22, T)	Review of Exam 3: Simulation
27 (04/24, R)	In-class Exam 3
28 (04/29, T)	Final Project Presentations

Welcome to my class!