Faculty Liberal Arts and Professional Studies
Department of Economics

Course: AP/ECON 4140, Section M, 3.0 – Financial Econometrics
Course Webpage: https://eclass.yorku.ca
Term: Winter 2025 (Course start and end date: January 6 – April 4)
Prerequisite / Co-requisite: AP/ECON 3210 3.00 or AP/ECON 3500 3.00, or equivalent.

Course Instructor: Pujee Tuvaandorj
Email: tpujee@yorku.ca
Time: Tuesday, 4:00 PM–7:00 PM
Location: VH3009
Office Hours: Wednesday 10:00 AM-11:00 AM in-person at VH 1120. The Zoom link will also be posted on eClass.
Teaching Assistant: TBA

Course Description

This course will cover the fundamentals of financial econometrics. The objective of the course is to introduce students to the basic characteristics of financial data and provide an account of the statistical models that aim to capture these empirical regularities. Estimation and evaluation of financial econometric models, and prediction of financial time series will be covered.

The course materials including announcements, lecture slides, notes, and problems will be posted on https://eclass.yorku.ca

Learning goals: At the end of this course, students will be able to

1. understand the properties of financial data,
2. understand the essential concepts in financial econometrics,
3. analyze financial data using econometric models,
4. estimate basic cross-sectional and time series models for finance,
5. interpret a computer output of model estimation and testing,
6. develop basic programming skills.

Required Textbook

• D. Ruppert and D. S. Matheson (2015), *Statistics and Data Analysis for Financial Engineering: with R examples*, Springer
https://www.amazon.ca/Statistics-Data-Analysis-Financial-Engineering/dp/1493951734/ref=tmm_pap_swatch_0?_encoding=UTF8&qid=&sr=

Paperback: $94.93
There are no restrictions preventing a student using a second-hand copy of each textbook/material.

The copies of the textbook will also be available in the campus bookstore. The following list of books may be useful as references for further study.

Supplementary Text (optional)

• Ruppert, David (2006), *Statistics and Finance*, 2nd Printing, Springer.

https://www.amazon.ca/Statistics-Finance-Introduction-David-Ruppert/dp/0387202706?ref_=ast_author_dp

Hardcover: $44.20

Outline

1. Probability and Statistics (Definitions, Theory, R example)
   Ruppert-Matheson, Appendix A and Chapters 5, 7
   Ruppert, Chapter 2

2. Time Series Models (ARIMA model, Box-Jenkins methodology, R example)
   Ruppert-Matheson, Chapter 12
   Ruppert, Chapter 4

3. Returns (Definitions, Stylized facts, R example)
   Ruppert-Matheson, Chapter 2
   Ruppert, Chapter 3

4. Portfolio Theory (Theory, Empirical example, R illustration)
   Ruppert-Matheson, Chapter 16
   Ruppert, Chapter 5

5. Regression (Theory, Empirical example, R illustration)
   Ruppert-Matheson, Chapter 9
   Ruppert, Chapter 6

6. The Capital Asset Pricing Model (Theory, Empirical example, R illustration)
   Ruppert-Matheson, Chapter 17
   Ruppert, Chapter 7

7. GARCH Models (Theory, Empirical example, R illustration)
   Ruppert-Matheson, Chapter 14
   Ruppert, Chapter 12

8. Value-at-Risk (Theory, Empirical example, R illustration)
   Ruppert-Matheson, Chapter 19
   Ruppert, Chapter 11

9. Option Pricing (Theory, Empirical example, R illustration) – if time allows
   Ruppert, Chapter 8

Note: The lecture outline is tentative and will be updated as the course progresses.

Evaluation

The overall grade for the course will be based on the **maximum** of

a) Final exam;
b) 0.7*Final exam+0.3*Midterm exam;
c) 0.6* Final exam+0.3*Midterm exam+0.1*Assignment;
d) 0.9*Final exam+0.1*Assignment;
where the highest possible marks for each (Final, Midterm, Assignment) is 100.

Category	Weight	Date	Due
Assignment	10%		
Midterm Exam	30%		
Final Exam	60%		

There will be one assignment that includes both problem solving and computer tasks. For the computer exercises, I recommend R or RStudio which can be downloaded free of charge from R-Project website: http://www.r-project.org https://rstudio.com/

Assignments received later than the due date will not be accepted. The final exam will be comprehensive.

Grading System: The grading scheme for the course conforms to the 9-point grading system used in undergraduate programs at York (e.g., A+ = 9, A = 8, B+ = 7, C+ = 5). Assignments and exams will bear either a letter grade designation or a corresponding number grade (e.g. A+ = 90 to 100, A = 80 to 90, B+ = 75 to 79, etc.) For a full description of York grading system see: https://calendars.students.yorku.ca/2023-2024/grades-and-grading-schemes

Midterm and Final Exam ID Verification

Please note the following:

- Driver's licenses are no longer acceptable as a form of identification and students are being urged to use their physical/mobile YU-card with photo for exam ID purposes.
- Students are permitted to present a valid physical passport as an alternative form of identification. Please see the Division of Students Exam website for more information.
- Students may use mobile YU-cards stored in the digital wallets on their phones.
- Students who do not yet have student cards to get their FREE YU-card by following the instructions found on the YU-card website.

Organization of the course

The course materials will be posted on the course's eClass website. The slides for the covered topics will be posted before each class. More details and explanations on the lecture topics will be provided during the meeting.

A part of the class time will be devoted to computer illustrations of the theoretical concepts, Q&A related to the presentation, and interactive activities.

Weekly office hours will be held in person and via Zoom through which students will interact with the course director/TA, as well as with one another. The Zoom link will be posted on the course's eClass website.

Please note the following:

- Zoom is hosted on servers in the U.S. This includes recordings done through Zoom.
- If you have privacy concerns about your data, provide only your first name or a nickname when you join a session.
- The system is configured in a way that all participants are automatically notified when a session is being recorded. In other words, a session cannot be recorded without you knowing about it.

To attend virtual office hours and participate in our virtual classroom, it is required that you have a computer with webcam and microphone or a smart device with these features.

Here are some useful links for student computing information, resources and help:
Student Guide to eClass/Moodle
Zoom@YorkU Best Practices
Zoom@YorkU User Reference Guide
Computing for Students Website
Student Guide to eLearning at York University

Assignment Submission, Lateness Penalties and Missed Tests

Assignment Submission: Proper academic performance depends on students doing their work, not only well, but on time. Accordingly, assignments for this course must be received on the due date specified for the assignments.

Lateness Penalty: Assignments received later than the due date will not be accepted and will be given a grade zero. Exceptions to the lateness penalty for valid reasons such as illness, compassionate grounds, etc., may be entertained by the Course Instructor but will require supporting documentation (e.g., a doctor's letter). If a student misses the assignments, and have a documented excuse, the final exam will carry the extra weight.

Missed Exams: If a student misses the midterm, and have a documented excuse, the final exam will also carry the extra weight. There will be no make-ups for the midterm exam. A deferral for the final exam will be granted only for a documented reason, such as illness, compassionate grounds, etc., for which supporting documentation should be provided. These students must fill out the Deferred Standing Agreement form and submit it along with all original supporting documentation to the Department of Economics within ten business days of the original exam date. See for details:

The Mach form for submitting an ECON deferred exam request:
https://www.yorku.ca/laps/econ/undergraduate-programs/academic-resources/department-policies/deferred-standing/

Other important course information for students

All students are expected to familiarize themselves with the information on Academic Standards, Curriculum & Pedagogy.

Academic honesty and integrity: In this course, we strive to maintain academic integrity to the highest extent possible. Please familiarize yourself with the meaning of academic integrity by completing SPARK's Academic Integrity module at the beginning of the course. Breaches of academic integrity range from cheating to plagiarism (i.e., the improper crediting of another's work, the representation of another's ideas as your own, etc.). All instances of academic dishonesty in this course will be reported to the appropriate university authorities, and can be punishable according to the Senate Policy on Academic Honesty.

Additional important information can be found on the Senate Committee webpage; http://secretariat-policies.info.yorku.ca/ :

- Ethics Review Process for research involving human participants
- Course requirement accommodation for students with disabilities, including physical, medical, systemic, learning and psychiatric disabilities
- Student Conduct Standards
- Religious Observance Accommodation

Course Add/Drop Deadlines

Information on important dates are available at https://registrar.yorku.ca/enrol/dates/2024-2025/fall-winter

	Winter Term 2024-2025 (W)
Last date to add a course **without permission** of instructor (also see Financial Deadlines)	January 20
Last date to add a course with permission of instructor (also see Financial Deadlines)	January 31
Last date to drop a course without receiving a grade (also see Financial Deadlines)	March 14
Course Withdrawal Period (withdraw from a course and receive a grade of "W" on transcript)	**March 15 – April 4**