Computer & Mathematical Sciences
UNIVERSITY OF TORONTO
SCARBOROUGH

STAD70H3 Statistics & Finance II

Fall 2023 Syllabus

Teaching Team:

Instructor:	Sotirios (Sotos) Damouras (sotirios.damouras@utoronto.ca, webpage)
	Office Hours: MO 11am-1pm & WE 9-11am @ IC456
Teaching Assistant:	Peng Liu (penn.liu@mail.utoronto.ca)

About the course

Welcome to STAD70! The course examines various statistical methods with important applications in Finance. In particular, you will learn how to:

- Model the distribution of asset returns
- Evaluate the performance and risk of a portfolios
- Identify and take advantage of trading opportunities
- Use simulation to price derivatives and assess risk

By the end of the course, you will understand the theory and rationale behind these methods and be able implement them effectively on real data using the `R` programming language. This course is a requirement for the Quantitative Finance stream of the Statistics Specialist program.

Homepage

The course and all materials will be administered online through Quercus.

Textbook

We will use lecture notes for the course, as well as two textbooks which are freely available from UofT's library in electronic form:

- Statistics and Data Analysis for Financial Engineering, 2nd Ed, by David Ruppert and David Matteson: we will use this book in weeks 1-6, and parts of week 8.
- Monte Carlo Methods in Financial Engineering, by Paul Glasserman: we will use this book in weeks 9-11.

Assessment

Your grade will be based on the following scheme:

Assessment	Details	Weight
5 bi-weekly Quizzes	In class	20%, best 4/5
Midterm	TBD, around week 8	35%
Final	TBD, April exam period	45%

There will be 5 short *in-person* quizzes during the last 15min of class on the following dates, and with the following coverage:

- Q1: Mon Jan 30, weeks 1-2
- Q2: Mon Feb 13, weeks 3-4
- Q3: Mon Mar 6, weeks 5-6
- Q4: Mon Mar 20, weeks 7-8
- Q5: Mon Apr 3, weeks 9-10

There will also be a 2hr midterm and a 3hr final. The midterm will cover the material in weeks 1-6 inclusive, and the final will be cumulative, covering everything in the course.

Missed Work Policy

- There will be *no extensions or make-ups* for any assessment (quizzes, midterm, or final).
- If you miss any number of quizzes, their marks will be *automatically* replaced (i.e. no need for justification) by your final exam marks.
- If you miss the midterm for a valid reason (e.g. health issue) you must declare your absence on ACORN within 2 days of the test date. Email the declaration to your instructor *within a week* of the missed test to have the weight of the term test shifted to the final. If you don't notify the instructor of your absence declaration you will get 0 marks on the midterm.
- If you miss the final exam for a valid reason, you must petition the Registrar to write a deferred exam, within 5 business days from the date of the missed examination; instructors are not involved in the petition process and you do not need to inform them.

Communication Policy

Questions about course content should be asked in lectures or directed to the course discussion board. We will be using Piazza as our primary discussion board for the course; you can enroll in Piazza through Quercus or at `https://piazza.com/utoronto.ca/winter2023/stad70`. The instructor will check in on a regular basis and selectively participate in discussions.

Questions regarding personal matters (e.g., absences, grading, marks) should be directly addressed to the instructor via email. Before sending an email, please make sure that you are not asking for information that is already available in the course outline/website/announcements. *All student emails to the instructor/TA should include:*

a) the course code and term in the subject line, which should start with `[STAD70 W23]`

b) your full name and student number in the body or signature of the email.
If either is missing your email will not be considered. Allow at least 48hr for a response before following up.

Weekly Topic Schedule

Week	Topic
1	Financial Data & Returns
2	Univariate Return Modeling
3	Multivariate Return Modeling
4	Portfolio Theory
5	Factor Models
6	Risk Management
7	Betting Strategies
8	Statistical Arbitrage
9	Monte Carlo Simulation
10	Simulation: Pricing Exotic Derivatives
11	Simulation: Variance Reduction Techniques
12	Optimization in Finance

Accessibility

The University of Toronto is committed to accessibility. If you require accommodations for a disability, or have any accessibility concerns about the course, the classroom, or course materials, please contact AccessAbility Services as soon as possible.

Health & Wellness

University life and academic studies can be stressful, so we encourage you to take good care of yourself. Do your best to maintain a healthy lifestyle throughout the semester by eating well, exercising, socializing, getting enough sleep and taking time to relax. This will help you achieve your goals and cope with stress.
If you, or anyone you know, experiences severe academic stress, difficult life events, or feelings of anxiety or depression, we strongly encourage you to seek support. Consider reaching out to a friend, family, or faculty member that you trust, sooner rather than later. Do not hesitate, because learning to ask for help is an important lesson in itself. And keep in mind that the University's Health & Wellness Centre is always available for counseling and support.

Academic Integrity

Academic integrity is essential to the pursuit of learning and scholarship in a university, and to ensuring that a degree from the University of Toronto is a strong signal of each student's individual academic achievement. As a result, the University treats cases of cheating and plagiarism very seriously. The University of Toronto's Code of Behaviour on Academic

Matters outlines the behaviours that constitute academic dishonesty and the processes for addressing academic offences. Potential offences include, but are not limited to:
In papers and assignments:

- Using someone else's ideas or words without appropriate acknowledgement.
- Submitting your own work in more than one course without the permission of the instructor in all relevant courses.
- Obtaining or providing unauthorized assistance on any assignment.

On quizzes and tests:

- Using or possessing unauthorized aids
- Looking at someone else's answers during an exam or test
- Misrepresenting your identity
- When you knew or ought to have known you were doing it

In academic work:

- Falsifying institutional documents or grades
- Falsifying or altering any documentation required by the University, including (but not limited to) doctor's notes
- When you knew or ought to have known you were doing so