

Financial Principles for Actuarial Sciences II

ACT370, Winter 2025

Monday 10:00am-1:00pm, SU Room B120

Instructor: Xiaofei Shi [xf.shi\[at\]utoronto\(dot\)ca](mailto:xf.shi@utoronto.ca)

TAs: Emma Kroell [emma.kroell\[at\]mail\(dot\)utoronto\(dot\)ca](mailto:emma.kroell@mail.utoronto.ca)

Sophia Chan [ianweng.chan\[at\]mail\(dot\)utoronto\(dot\)ca](mailto:ianweng.chan@mail.utoronto.ca)

Office Hours: Online with Zoom Meeting ID: 830 7130 0336

Emma Kroell: Tuesday 1:30 - 2:30 pm

Sophia Chan: Thursday 3:30 - 4:30 pm

Course Description: The course covers financial derivatives, their pricing and hedging. The course is composed of three parts, the first is an overview / review of financial instruments, such as bonds, stocks, and their forwards, futures, and options. The second part is devoted to pricing of financial instruments in discrete time using the Binomial asset pricing models. The third part covers pricing of financial instrument in continuous time using the Black-Scholes formula.

- Introduction to pricing financial instruments (forwards, future, option pricing, no arbitrage)
- Binomial asset pricing model (replicating portfolios, risk neutral pricing, multi-period Binomial model)
- Black-Scholes Model (Brownian Motion, Black-Scholes formula, Greeks)

Course Prerequisites: ACT240H1 (minimum 63%); ACT245H1 (minimum 63%); ACT247H1 (minimum 63%).

Course Corequisites: : STA257H1; MAT237Y1/MAT257Y1.

Textbook: [Stochastic Calculus for Finance I: The Binomial Asset Pricing](#), Steven Shreve.

Tentative Schedule :

- Quiz 1: Sometime before Reading Week
- Quiz 2: Sometime after Reading Week
- Midterm: Mar 10th
- Final Exam: TBD

Evaluation: (10% for Quiz)*2 + 30% for Midterm + 50% for Final Exam.

Canadian Institute of Actuaries (CIA)'s University Accreditation Program (UAP): This course is one of the mandatory courses under the Canadian Institute of Actuaries (CIA)'s University Accreditation Program (UAP). UAP has moved away from the course-by-course accreditation method and toward the program accreditation method (the "Pathway 1 of CIA qualification"). Under the new pathway, to obtain ACIA (Associate of CIA) professional credential, students need to:

1. Complete a degree from an actuarial program (ACT Specialist or Major) at University of Toronto and pass a list of mandatory courses. No minimum course grade or GPA is required as long as students pass all the mandatory courses. The full list of UofT's 16 mandatory courses are: ACT240, ACT245, ACT247, ACT348, ACT349, ACT370, ACT451, ACT452, ACT466, STA257, STA261, STA302, STA314, ECO101, ECO102, MGT201/RSM219.

For transition: CIA will accept an actuarial degree from UofT completed between June 30, 2015 and October 31, 2024 without all the specified mandatory courses.

2. Complete the ACIA Module (administered by CIA, projected Spring 2024)

For transition: a student can be exempt from the ACIA Module if they complete SOA exam PA and the 8 FAP Modules and assessments by December 31, 2024.

3. Complete an open-book ACIA Capstone Exam (administered by CIA, projected Fall 2024).

For transition: a student can be exempt from the capstone exam by completing any combination of UAP credits or exams for P, FM, IFM, LTAM, STAM and SRM by October 31, 2024. The deadline to apply for UAP credits is September 30, 2024. Details on the new pathway for students can be found here: <https://education.cia-ica.ca/acia/acia-for-accredited-university-students/>

Academic Integrity: Academic integrity is fundamental to learning and scholarship at the University of Toronto. As a result, U of T treats cases of cheating and plagiarism very seriously. Please read the University of Toronto's Code of Behaviour on Academic Matters available at [University of Toronto website on Academic Integrity](#) All suspected cases of academic dishonesty will be investigated following procedures outlined in the Code of Behaviour on Academic Matters. If you have questions or concerns about what constitutes appropriate academic behaviour or appropriate research and citation methods, please reach out to us. Note that you are expected to seek out additional information on academic integrity from other institutional resources, such as [The Office of the Governing Council](#)

Policy on Missing Exams If you miss the midterm or the final exam for a legitimate reason, then you must contact the instructor within 24 hours of missing the exam (and preferably pre-empt by sending an email explaining the legitimate reason, e.g., illness). If your missed exam is deemed legitimate, then you will have the opportunity to sit through a **verbal makeup exam** with the instructor of **no less than 30 minutes**. The content will be the same covered by the exams, but the questions asked will differ from the delivered exams.

Policy on Regrading The course regrading policy exists to correct mistakes, and any request should clearly identify the error (for example, a question that was not marked, or a total incorrectly calculated). Requests to correct such mistakes must be sent by email to the instructor and the TA, within **48 hrs** after the homework/exam was returned. Note that if a student requests for a re-mark, the entire assignment may be re-marked. So, the new grade may go up, go down or remain the same.

Policy on Collaboration: You are encouraged to work together on the homework. Discussing the homework problems with one another can be a valuable learning experience. However, it is a violation of the rules on academic integrity to copy another student's solution and submit it as your own. You should write up your solutions separately, not referring to a common document. Furthermore, you should not submit any work that you do not fully understand. You should be able to start with a clean sheet of paper and without notes or assistance write out the solution to any homework solution you submit. If you will do that with every homework you submit, the similarity between your solutions and those of other students will not arouse suspicion. More importantly, you will be well prepared for the interviews. You are not permitted to use homework solutions for this course from previous years or solutions you find from other sources, including the internet. If multiple students turn in identical solutions, all of them will receive a zero. People caught cheating generally tell a story about being unable to keep up with the material. First of all, remember that you can submit homework late. Secondly, if there is something going on in your life that makes it hard for you to keep up, please let me know. That brings me to the following point.

Take Care of Yourself: It is easy for me to say and hard for all of us, including me, to do, but taking care of your physical and mental health is essential, especially during the COVID-19 pandemic. Life is a marathon, and you need to pace yourself. Do your best to maintain a healthy lifestyle by eating well, exercising, avoiding drugs and alcohol, getting enough sleep and taking some time to relax. This will help you achieve your goals and cope with stress. If you or anyone you know experiences extreme academic stress, difficult life events, or feelings of anxiety or depression, I strongly encourage you to seek support. Counseling and Psychological Services is here to help 24/7, and everything will be confidential: <https://mentalhealth.utoronto.ca/>
In addition, consider reaching out to a friend, faculty or family member you trust for help getting connected to the support. Keep in mind that for serious psychological issues, the first counselor you meet with may not be the right one for you, but this does not mean you should give up on counseling. Keep looking for someone who can help you.

- If you or someone you know is feeling suicidal or in danger of self-harm, call immediately, day or night:
Non-urgent campus police: 416-978-2323
- If the situation is life threatening, call the police:
Urgent campus police: 416-978-2222
Off campus: 911

If you have questions about this advice, your coursework, or anything else about which I might be helpful, please let me know.

Copyright Notice All course materials, including notes, examples, and questions from assessments, are the property of the author, instructors, or TA (as relevant) and may not be distributed online or by any other means. You are permitted to download session materials for your own academic use, but you should not copy, share, or use them for any other purpose without the explicit permission of the instructors.
