

**University of Toronto**  
**Department of Statistical Sciences**  
**ACT230H1F**  
**Mathematics of Finance for Non-Actuaries**  
**Fall 2024**

**Course Information**

Instructor Hassan Abdelrahman  
Email hassan.abdelrahman@mail.utoronto.ca  
Lectures Mondays 11:00 – 13:00; Room BA 1130  
Office Hours Thursdays 16:00 – 17:00; Online through Zoom

T.A. Arturo Esquivel – Sophia Chan  
Email a.esquivel@mail.utoronto.ca - ianweng.chan@mail.utoronto.ca  
Tutorials Fridays 10:00 – 11:00; **Online through Zoom**

**Course Description**

Introduction to financial mathematics, interest measurement, present value calculation, annuity valuation, loan amortization, consumer financing arrangements, bond valuation. The course is aimed at a general audience who will not be continuing in the actuarial science program.

**Teaching Style**

My teaching strategy for this course involves closely following the coursebook. During lectures, I will provide slide shows that include only the key points of each topic. However, I will annotate on these slides during the lecture to provide additional context and elaboration. I will upload these slides before the lectures so that you can bring them to class and add your own annotations if you wish (I recommend you to do so). After each lecture, I will also upload my annotated version of the slides. It's important to note that succeeding in this course requires you to read the coursebook, complete the problem sets, and attend tutorials in addition to the lectures. The lectures are intended to help you understand the course material, but you must do independent work as well.

**Required Text**

- ACT230 textbook, Samuel A Broverman.

The textbook may be found in a printed form at the U of T bookstore.

**Course Outline**

This course outline is just tentative. Some sections might go faster than others.

Date	Schedule	Topic	Quizzes
Sep 9	Lecture 1	Section 1 – Effective Rates of Interest & Discount	
Sep 13	Tutorial 1		
Sep 16	Lecture 2	Section 2 – Nominal Rates of Interest & Discount	
Sep 20	Tutorial 2		
Sep 23	Lecture 3	Section 3 – Force of Interest, Inflation, Risk of Default	Quiz 1
Sep 27	Tutorial 3		
Sep 30	Lecture 4	Section 4 – Annuity-Immediate & Annuity-Due	
Oct 4	Tutorial 4		
Oct 7	Lecture 5	Section 5 – Annuity Valuation At Any Time Point	Quiz 2
Oct 11	Midterm 1		
Oct 14	Thanksgiving Holiday		
Oct 18	Tutorial 5		
Oct 21	Lecture 6	Section 6 – Annuities With Differing Interest and Payment Periods	
Oct 25	Tutorial 6		
Oct 28	Reading Week		
Nov 4*	Lecture 7	Sections 7 – Annuities Whose Payments Follow a Geometric Progression	Quiz 3
Nov 8	Tutorial 7		
Nov 11	Lecture 8	Sections 8 – Annuities Whose Payments Follow an Arithmetic Progression	
Nov 15	Midterm 2		
Nov 18	Lecture 9	Section 9 – Amortization of a Loan	Quiz 4
Nov 22	Tutorial 8		
Nov 25	Lecture 10	Section 10 – Bond Valuation	
Nov 29	Tutorial 9		
Dec 2	Lecture 11	Section 11 – Bond Amortization, Callable Bonds	Quiz 5
Dec 3**	Lecture 12	Review (if needed)	

\* Note that November 4 is the last day to drop the course.

\*\* We will have our last class on Tuesday, December 3 to substitute for the Thanksgiving holiday. The time and location of the class are TBA.

### Course Assessments

There will be five online quizzes (30 minutes each), two **in-tutorial** midterm tests (1 hour each) and one final exam (2 hours). The dates and the weights of the assessments are given below:

Assessment	Date of Evaluation	Weighting
Quizzes	Mondays*	15%
Midterm 1	Oct 11	25%
Midterm 2	Nov 15	25%
Final	TBA	35%

Assessment	Date of Evaluation	Weighting
Total		100%

\* Dates: Sep 23, Oct 7, Nov 4, Nov 18 and Dec 2.

On its scheduled date, a quiz will be posted on Quercus no later than 9 am, and the quiz window will remain open until midnight. Each quiz will cover the content taught in the previous two classes. Once you start the quiz, you'll have 30 minutes to finish it. I will drop the lowest two quizzes.

The structure and content of the exams will be announced at least one week in advance of each exam.

### Missed Quizzes or Tests

There are NO make-up quizzes, and so, no marks will be given to missed quizzes. If the midterm is missed for a valid reason, you must provide appropriate documentation, such as the University of Toronto Medical Certificate, University of Toronto Health Services Form, or College Registrar's Letter. You must submit this documentation within one week of the test. If documentation is not received in time, your test mark will be zero. If midterm is missed for a valid reason, the weight of that midterm (or those midterms) will be shifted to the final. For example, if you take the first midterm and miss the second midterm for a valid reason, then your evaluation will be based on the formula  $15\% \times \text{quizzes} + 25\% \times \text{midterm 1} + 60\% \times \text{Final}$ .

**You are not allowed to miss the two midterm tests. Missing both tests would result in an automatic deduction of 25%.**

### Accessibility Needs

Students with diverse learning styles and needs are welcome in this course. In particular, if you have a disability/health consideration that may require accommodations, please feel free to approach me and/or Accessibility Services at 416-978 8060; [studentlife.utoronto.ca/as](http://studentlife.utoronto.ca/as).

### Academic Integrity

At the University of Toronto, academic integrity is a vital part of the learning and academic experience. All assessments and coursework must be completed solely by the individual student, without any outside help. Receiving any form of assistance on an assessment, whether from a fellow student in the course or someone not affiliated with the course, is a severe academic offense. Additionally, providing help to another student in the course on an assessment is equally serious. Posting or sharing questions from assessments is strictly prohibited at all times.

Please further familiarize yourself with the University of Toronto's Code of Behavior on Academic Matters available at <http://academicintegrity.utoronto.ca>, or you may also look at <https://www.artsci.utoronto.ca/current/academic-advising-and-support/student-academic-integrity>.