

ACT230H1F Mathematics of Finance for Non-Actuaries
Course Syllabus
Fall 2021

Course Information:

- Instructor: Shuai (Alex) Yang, Ph.D.
- Email: shuai.yang@mail.utoronto.ca
(note: when sending an email to me or your TA, please always include 'ACT230' in the subject line)
- Lectures : Tuesday 18:00 - 20:00, delivered online through Zoom or through pre-recorded videos.
- Tutorials: Friday 10:00 - 11:00, delivered in-person. The first tutorial is on September 17th.
 - Tutorial session 0101 (last name A-L): Room MC 254
 - Tutorial session 0102 (last name M-Z): Room UC 161
- TAs:
 - Tutorial session 0101: Christian Fiedler (christian.fiedler@mail.utoronto.ca)
 - Tutorial session 0102: Xiao (Susan) Lu (susanlu.lu@mail.utoronto.ca)
- Office hour:
 - Regular office hour: Tuesday 10:00 - 11:00, conducted online through Zoom.
 - In-person office hour: TBD

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.

Pre-requisites

First-year Calculus. (If you do not have the pre-requisites and still wish to take this course, then please discuss with me by Sept 17th; otherwise you will be removed at the end of the second week.)

Course Material:

Required:

- Prof. Sam Broverman's Coursebook for ACT230.
- Calculator: Texas Instruments BA II Plus (or other similar financial calculator).

Other useful references:

- *Mathematics of investment and credit* by Prof. Sam Broverman.
- Society of Actuaries (SOA) Exam FM exam webpage ¹ which can be found at <https://www.soa.org/education/exam-req/edu-exam-fm-detail/>

Course Website:

All relevant course materials will be posted on Quercus. Please check the course webpage on a regular basis (**at least daily**) for course materials and announcements.

Tentative Schedule ²:

- September 14th: Lecture 1
 - Course Overview
 - Section 1: Calculus Review and Effective Rates of Interest and Discount
- September 21st: Lecture 2
 - Section 2: Nominal Rates of Interest and Discount
- September 28th: Lecture 3
 - Section 3: Force of Interest, Inflation, Risk of Default
- October 1st: **Quiz 1**
- October 5th: Lecture 4
 - Section 4: Annuity-Immediate and Annuity-Due
- October 8th: **Midterm 1**
- October 12th: Lecture 5
 - Section 5: Annuity Valuation At Any Time Point
- October 15th: **Quiz 2**
- October 19th: Lecture 6
 - Section 6: Annuities With Differing Interest and Payment Periods
- October 26th: Lecture 7
 - Section 7: Annuities Whose Payments Follow a Geometric Progression
- November 2nd: Lecture 8

¹Only those related to the material covered in this course.

²This schedule is only for planning purpose, the actual schedule may vary depending on the progress. If there is any change regarding the test coverage, an announcement will be made in the course webpage.

- Section 8: Annuities Whose Payments Follow an Arithmetic Progression
- November 5th: **Quiz 3**
- November 16th: Lecture 9
 - Section 9: Amortization of a Loan
- November 19th: **Midterm 2**
- November 23rd: Lecture 10
 - Section 10: Bond Valuation
- November 26th: **Quiz 4**
- November 30th: Lecture 11
 - Section 11: Bond Amortization, Callable Bonds
- December 7th: Lecture 12
 - Section 12: Measures of the Rate of Return on a Fund

Evaluation:

There will be four in-tutorial quizzes (10 minutes each), two in-tutorial midterm tests (50 minutes each) and one final exam (2 hours). Their weights toward the final grade are:

- 5% per quiz (20% in total)
- 15% per mid-term test (30% in total)
- 50% for the final exam

The last day to drop the course is **November 8, 2021** (<https://www.artsci.utoronto.ca/current/dates-deadlines/academic-dates#academic-dates-deadlines-accordion-4>).

Missed Quizzes or Tests:

- Quizzes:
 - Take place in tutorial, testing time is around 10 mins.
 - There will be no make-up quizzes.
 - No marks will be given to missed quizzes.
- Mid-term test:
 - Take place in tutorial, testing time is around 50 mins.
 - There will be no make-up mid-term tests.

- 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 $20\% \times \text{quizzes} + 15\% \times \text{midterm 1} + 65\% \times \text{Final}$.
- Final exam:
 - In order to pass the course, you **must** take the final exam.
 - If you miss the final exam, you **must** notify the instructor (also cc your TA) **within 24 hours** of the time of the final exam and schedule a make-up final exam.
 - **Only one** make-up final exam will be given. The make-up exam **may contain both a written part and an oral examination part**.

Accessibility Needs

The University of Toronto offers academic accommodations for students with disabilities. If you require accommodations, or have any accessibility concerns about the course, the classroom, or course materials, please contact Accessibility Services at accessibility.services@utoronto.ca or visit <http://accessibility.utoronto.ca>.

Academic Integrity

You should always keep the academic integrity in mind. The latest version of the student handout ‘How not to Plagiarize’ is available at <http://www.writing.utoronto.ca/advice/using-sources/how-not-to-plagiarize>.

In addition, you are responsible for knowing the content of the University of Toronto’s **Code of Behaviour on Academic Matters** at <http://www.governingcouncil.utoronto.ca/policies/behaveac.htm>. If you have any questions about what is or is not permitted in this course, please do not hesitate to contact me. The bottom line: copying is strictly prohibited.

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