ACT230H1 Mathematics of Finance for Non-Actuaries
Course Syllabus
Fall 2017

General Information:

- Lectures : Monday 10 am - 12 pm at SS (Sidney Smith Hall) 2118. [1]

- Holidays & Reading week :

    - Thanksgiving: October 9th

    - Reading week : November 6th - November 10th

- Make-up Lecture : December 7th (TBD)

- **Last day to cancel F section code courses without academic penalty : November 6th**

- Tutorials: Friday 10 am - 11 am at SS 1070, SS 1087 and SS 2127.

    - Last name from A to Ka, please go to room SS1087

    - Last name from Kh to So, please go to room SS2127

    - Last name from Sun to Z, please go to room SS1070

- Instructor: Alex Yang

- Email: shuai.yang@mail.utoronto.ca

- TA: Samson Fung, Peng Liu, Xingshuo (Noble) Zhai

- Alex's Office hours: Monday 2 - 3 pm at SS 1091 or by appointment

- TA's Office hours: Friday 11 am - noon

- TA's Office location: SS623B (New Stat Aid Center)

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.

Course Material:

Textbook:

- Prof. Sam Borverman's Study Guide for SOA EXAM FM/CAS EXAM 2.

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[1]The first lecture is on Sep 11st and the last lecture is on Dec 4th.

Calculator:

- Calculator: It is **highly recommended** to use a financial calculator (e.g. BA II Plus, BA II Plus Professional) for this course as we will be doing calculation involving annuities, bond and internal rate of returns, etc.

  Note : Both of the textbook and calculator can be purchased from the U of T actuarial science club.

Other useful references:

- *Mathematics of investment and credit* by Prof. Sam Broverman .

- Society of Actuaries (SOA) Exam FM sample questions [2] which can be found at
  https://www.soa.org/files/pdf/FM-09-05ques.pdf

Course Website:

All of the lecture notes [3], practise questions, announcements, etc. will be posted on portal at
https://portal.utoronto.ca

Tentative Schedule[4]:

- Lecture 1:

  - Introduction, basic math review (section 1).
  - Nominal rates of interest and discount (section 2).

- Lecture 2: Force of interest, inflation (section 3).

- Lecture 3: Annuity immediate and annuity due (section 4).

- Lecture 4: Annuity valuation at any time-point (section 5).

- **October 9th, no class**

- Lecture 5: Annuities with different interest and payment periods (section 6).

- **October 13th, midterm 1**

  - One hour exam with 10 multiple-choice questions.
  - Coverage: Lecture 1 - Lecture 4.

- Lecture 6: Annuities with payments follow a geometric progression (section 7).

- Lecture 7: Annuities with payments follow an arithmetic progression (section 8).

- **Reading week: November 6 - November 10, no class**

- Lecture 8: Loan amortization. (section 9).

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[2]Only those related to the material covered in this course.
[3]Some of the material from the lecture notes are supported by Prof. Sheldon Lin.
[4]The material in the lectures are subject to change depending on class pace.

- **November 17th, midterm 2**

    - One hour exam with 10 multiple-choice questions.
    - Coverage: Lecture 5 - Lecture 8.

- Lecture 9: Loan repayment, sinking fund method (section 10).

- Lecture 10: Introduction on Bond. Bond valuation (section 11).

- Lecture 11: Bond amortization, callable bonds (section 12).

- Make-up Lecture 12: (December 7th TBD)

- **Final exam (time & location TBA)**

    - Two hours exam with 20 multiple-choice questions.
    - Coverage: Lecture 1 - Lecture 11 (or Lecture 12, TBA).

Evaluation:

There are two midterm tests and one final exam. Your final grade is based on the following scheme:

$$20\% \times \text{Midterm 1} + 20\% \times \text{Midterm 2} + 10\% \times \text{Quiz} + 50\% \times \text{Final}$$

The two midterms are **NOT** cumulative. The final exam is cumulative which tests everything we learnt throughout the semester. Quizzes are conducted during tutorials and will be testing basic knowledge you learnt from the week. Each quiz worths 10 marks and you receive at least 5 if you take it.

The two midterms and final exam are **closed book and closed notes**, an SOA-approved financial calculator (e.g. mentioned above in the course material section) or a non-programming calculator is allowed. You **can bring multiple calculators** to the exam if you wish. **Some of the questions in the test papers are from lecture examples, tutorial questions and assigned problems.**

Midterms are held during the tutorial times in the tutorial rooms.

If a midterm (two midterms) is (are) 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 the appropriate documents are received within one week from the test time, then 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 $20\% \times \text{Midterm 1} + 10\% \times \text{Quiz} + 70\% \times \text{Final}$.

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.