ACT 230 Math of Finance

Vital Statistics:
Instructor: Vicki J. Zhang, FSA, ACIA, CERA, MStat (with completion of PhD qualification exams)
Lectures: Tuesdays, 7-9pm
Lecture location: SS 2127
Tutorials: Tuesdays, 6-7pm
Tutorial Location: TBD (will be posted on Blackboard)
Office: 6th floor, SS Room 6015
Office Hour: Mondays, 1-3 pm
Virtual office hour: TBD (announced early every week)
Blackboard: http://portal.utoronto.ca
Email: vickijing.zhang@utoronto.ca

Textbook and calculator:
The main textbook we will use for this course is Sam Broverman's Study Guide for SOA EXAM FM/ CAS EXAM2. Both 2013 and 2014 editions are accepted. The Actuarial Club has made cheaper version of this study guide available. Detailed textbook purchase information from the Actuarial Club is posted in the course portal.

You need a financial calculator for this course. You are highly recommend to get one from the following list: battery or solar–powered Texas Instruments BA–35 model calculator, the BA II Plus, the BA II Plus Professional, the TI–30Xa or TI–30X II (IIS solar or IIB battery), or TI-30X MultiView (XS Solar or XB Battery). However, other financial calculators may work as well.

Key requirement to the students attending the lectures:
To encourage active learning, in this semester I will employ a pedagogical model similar to a "flipped classroom". What this means is that you are required to read certain sections of the textbook before coming to the lecture *from the second week of the semester*. The required reading sections will be posted on the blackboard by Wednesday. During the lecture (next Tuesday), we will have more time to discuss the challenging concepts and materials. There will also be various in-class activities in the form of individual quiz or small team competition. If you have read the required section before coming to class, you are more likely to do well in those in-class activities and earn bonus points (which can be applied to your final course evaluation).

Evaluation:
10% In-class activities (can earn up to 5 bonus points)
25% Term Test 1 (October 14th in Tutorial hour)
25% Term Test 2 (November 11th in Tutorial hour)
40% Final Exam

Examples of in-class activities:
- Think-pair-share (1 bonus point per question may be awarded for the first pair that get the answer right)

- Revised "Jeopardy" (different bonus points per question based on the level of the question. Played in pair or by individual)
- Peripatetic activity (various questions will be posted at the front. Students can walk to the front to post solutions on the questions they'd like to answer. 1 bonus point per question for the first student who gets the answer right. The student in this activity is expected to do a "micro-teaching", or explain how they reach the answer)
- Individual quiz (1 point for each quiz submitted. You should have reasonable steps to reach the final answer in your submission, even if the final answer is incorrect. Please submit to the right pile under your own TA's name – I will bring TA name tags)
- Other activities that the instructor sees fit
- **Note:** it is at my discretion to pick the students to answer the question. In the case that more than one student/pair volunteer for the same question, I am likely to pick the one who has not answered many questions in the past, to encourage new participants. Not all in-class questions will result in bonus points. Please listen to the instruction carefully. Activity winners will register with me at the end of each lecture. The bonus points will be tallied after each lecture and posted on blackboard by the time of next lecture. You have to check your points immediately and report any dispute by the end of day of the next lecture. We do not keep any records of in-class activities (including quiz papers) after the next lecture.

Schedule of Topics:

Lecture - September 9 (we will start at 6pm just for the first lecture, since there is no tutorial in the first week. We may end the lecture earlier than 9pm if all the topics are covered):
- Overview of the course
- Simple and compound interest, Present value of cashflow (Section 1)
- Rate of discount d (Section 1)

Lecture - September 16:
- Nominal rates of interest (Section 2)
- Nominal rate of discount (Section 2)

Tutorial – in-class with TA

Lecture - September 23:
- Force of interest (Section 3)

Tutorial – in-class with TA

Lecture - September 30:
- Annuity products in the market
- Annuity Immediate and Annuity Due (Section 4)

Tutorial – in-class with TA

Lecture - October 7:
- Annuity valuation (Section 5)

Tutorial – in-class with TA

Lecture - October 14:
- Annuity with different interest and payment period (Section 6)

Tutorial – Term Test 1 (50 mins) - October 14

Lecture – October 21
- Valuation of annuities following a geometric progression (Section 7)

Tutorial – Term Test 1 review with TA

Lecture - October 28:
- Valuation of annuities following an arithmetic progression (Section 8)

Tutorial – in-class with TA

Lecture – November 4:
- Amortization of a loan (Section 9)

Tutorial – in class with TA

Lecture - November 11:
- Sinking fund method of loan repayment (Section 10)

Tutorial – Term test 2 (50 mins) – November 11th

November 18: Fall break, no class

Lecture - November 25:
- Bond valuation (Section 11)

Tutorial – Term test 2 review with TA

Lecture - December 2: (we will start at 6pm just for the last lecture, since there is no tutorial in the last week. We may end the lecture earlier than 9pm if all the topics are covered):
- Bond amortization (Section 12)
- Callable bond (Section 12)

Final Exam – Date TBA
- Covers all the materials we covered in the course

Missed Term Tests and Final Exam

- There is **NO** make-up term test
- There will be **ONE** make-up final test arranged by Faculty of Arts and Science directly.

A Word on Tutorials:

In the past one of the common feedbacks from students is that they do not find tutorials with TAs particularly useful. There are 10 tutorials with TAs this semester (there is no tutorial in the first and last week). Four of them will be used for term tests and term test reviews. The remaining 6 will be used as a type of group office hour with your TA. I will post a list of end-of-section questions on the blackboard that you DO NOT need to know. Students in this course are highly recommended to work on all the other end-of-section practice questions. They should post their "muddiest points" – concepts they do not quite understand from the lectures, end-of-section questions they deem challenging, or question solutions in the textbook they do not fully understand – to their own TA by 5pm on Monday before your tutorial on Tuesday. The concepts and questions can be related to any section we have covered in lectures so far – they do not have to be from the most recent lecture/sections. TAs will then strive to address as many of these muddiest points as possible in the tutorials. You are welcome to walk in with your questions as well. However, please respect the fact that TAs usually need some time to think through the questions themselves. So to not waste TA's and your fellow students' time, it is best to post the questions the day before so TAs can come to the tutorial prepared.