

**ACT 349H1F 201409: Topics in Actuarial Mathematics (Corporate Finance)**

*(Oct 7, 2014 version, please monitor updates at [www.utstat.utoronto.ca/sharp](http://www.utstat.utoronto.ca/sharp))*

**‘Only about 40% of students graduated in the U of T actuarial science program eventually get a job in the actuarial field’**

(U of T Act Sci Club statement, 2007: formal instructor attempts at data collection are handicapped by university privacy rules but it seems likely that the 40% has dropped to below 30%). Enrolment in actuarial science programs Canada-wide has multiplied by perhaps five in the last 25 years and entry level actuarial jobs have become much more difficult to find in Canada and most other countries. Graduates with little work experience have often been unable to find an entry level actuarial job. Students enthusiastic about actuarial science and/or CFA are advised to improve their career prospects by developing a broader business background too, to ensure that their Excel skills are competitive, to pass SoA exams and, most of all, to get office work experience. Also enhance your communication skills e.g. by attending a Toastmaster club ([www.toastmasters60.org](http://www.toastmasters60.org)) and gaining the ‘Competent Toastmaster’ certificate for giving ten 7-minute speeches to about 15 people and using the feedback provided. The Chartered Financial Analyst (CFA) exams are an easier (but not easy) option, make use the material from this course and have a fairly similar examination format: see [www.utstat.utoronto.ca/sharp](http://www.utstat.utoronto.ca/sharp) and [www.cfainstitute.org](http://www.cfainstitute.org). The CFA job market has tightened in recent years, but it is widely recognized by many types of employer as distinguishing your resume from a thousand others. However, non-actuarial employers are likely to see value in courses on math-of-finance, interest, mortgages etc.

<b>Lecture Section</b>	<b>L0101</b>	
<i>Lecture</i>	W4-7 (First 4:00pm Sep 10, from Sep 17 TA is first hour)	SS2135
<i>Instructor and office hours</i> Keith Sharp PhD FCIA FSA CFA <a href="mailto:sharp@utstat.utoronto.ca">sharp@utstat.utoronto.ca</a> <a href="http://utstat.utoronto.ca/sharp">http://utstat.utoronto.ca/sharp</a>	Tu 10:30am-noon	SS6025
<i>Tutorials (First Sep 17, 2014 4pm)</i>		<i>Family names</i>
Jennifer Jinyoung Yang <a href="mailto:jinyoung@utstat.utoronto.ca">jinyoung@utstat.utoronto.ca</a>	W 4:00-5:00pm SS2135	A-L
Li, Zhi <a href="mailto:zhiqi.li@mail.utoronto.ca">zhiqi.li@mail.utoronto.ca</a>	W 4:00-5:00pm SS1070	M-Z
<b>Tentative Coverage</b>	<b>Lecture and test date</b>	<b>Brealey 11th</b>
Goals, governance, Value of stocks	Sep 10, 2014 (No tutorial, lecture starts at 4:00pm)	Ch. 1, 4
Net Present Value	Sep 17	Ch 5, 6
Risk, Return, Opp cost of cap	Sep 24 (Have textbook by today)	Ch. 6, Ch. 7
<b>TERM TEST 1 (Note time)</b>	Oct 1 4:00 pm (Likely in lecture room plus another)	TERM TEST 1
CAPM, Risk and return	Oct 1 5:00 pm	Ch. 8
Risk and return	Oct 8	Ch. 8, 9
Project analysis, decision trees	Oct 8	Ch. 10
Strategy, economic rents. Efficient markets	Oct 15	Ch. 11
<b>TERM TEST 2 (Note time)</b>	Oct 22, 4:00 pm (Likely in lecture room plus another)	TERM TEST 2
Financing, Debt policy	Oct 22, 5:00 pm	Ch. 13, Ch. 17
How much to borrow, interest tax shields	Oct 29	Ch. 18
Financing and valuation, WACC	Nov 5	Ch. 19
Real options	Nov 12	Ch. 22
Leases	Nov 19	Ch. 25
Financial ratios	Nov 26, 2014	Ch. 28
Final exam	Dec 8-19, 2014 Exam Period	

The timing of lecture coverage will likely deviate from the day-to-day schedule above. This outline and updates are at <http://www.utstat.utoronto.ca/sharp>. Assignments and other info are posted on the course Blackboard password-accessed portal – you will wish to monitor the portal every few days. Also please ensure that the portal ‘knows’ an email address for you which you monitor frequently, otherwise you’ll miss course-related emails.

**Text**

Brealey, Myers and Allen, *Principles of Corporate Finance, 11th<sup>th</sup> Ed.*

11th N. American Edition, 2014 (ISBN 978-0-07-803476-3, hard cover, about \$250), or

11th Global Edition 2014 (ISBN 978-0-07-772495-5, soft cover, about \$100+unpredictable duties & fees eg from Prime Books, Malaysia via abebooks.com ) The Global Edition differs only in page numbering, is acceptable for this course, and is legal to import, at least if imported as a single copy. The access code is not essential. Importation and redistribution of multiple copies is specifically legal in the US. (*Quality King Distributors Inc., v. Lanza Research International Inc., 523 U.S. 135* (1998)). Enough changes have been made by the authors and publisher to make the previous edition unusable. The ‘International Edition’ from India is understood to be of lower print etc. quality. You are expected to read and understand the descriptive portions of the text yourself. Some of the exam questions will come from the text reading, especially significant statements which need to be thought about to be understood.

### Calculator:

A non-programmable financial calculator is needed at each lecture, tutorial, test and exam. “Financial” can be defined here as “Can solve  $3.803=(1+(1+i)^{-4})/i$  to get interest rate  $i$ ”. The Texas Instruments BA II PLUS calculator is one of the calculators allowed on the Society of Actuaries exams and on the CFA Chartered Financial Analyst exams: see [www.cfainstitute.org](http://www.cfainstitute.org); it has the financial functions that would be needed for this course and is recommended. U of T Bookstore is worth trying – sometimes it’s at the northeast cash. If you have trouble finding it, you can buy it on the web or phone ‘bank core’ *Staples* stores.

### Intended Audience, VEE Credit

Students who expect to take the professional actuarial exams of the (Chicago-based) Society of Actuaries ([www.soa.org](http://www.soa.org)) or Casualty Actuarial Society ([www.casact.org](http://www.casact.org)). No disgrace if you fail-in fact you can keep it secret if you wish (I took some SoA exams in Buffalo NY just in case I failed one!). To qualify as FSA and/or FCIA takes years of tough self-study. The professional exams, co-sponsored by the Canadian Institute of Actuaries ([www.actuaries.ca](http://www.actuaries.ca)), are rigorous. Hence ACT349 is structured around the syllabus and the examination philosophy of the SoA and CAS: multiple choice, mostly numerical, questions which must be quickly and accurately done. Please see [www.beanactuary.org](http://www.beanactuary.org) for details, for sample exams and to submit exam applications. You are expected to read the text ahead of the lectures. Questions and in-class discussions are encouraged. You will find it useful to sometimes read the *Wall Street Journal* (print or [www.wsj.com](http://www.wsj.com)) or *Globe and Mail Report on Business* (<http://www.theglobeandmail.com>). This course relates closely to ‘real world’ situations. SoA VEE credit is available only to those who score 70 (B-) in this course; typically this has been about half the class. The SoA has final say and may refuse credit.

### Exams

You will wish to do all the relevant assignment questions before each test and final exam, and preferably many others as well. As for many professional exams, care will be taken to ensure the privacy of your answers by use of assigned seating and by the provision of several versions of tests and final, with different question orders and with dummy questions to make Scantrons more private. Anyone considering cheating should be aware that the Canadian Institute of Actuaries, under pressure from the provincial and federal governments, monitors the honesty and possible corruptibility of those it admits as actuaries. As a FCIA ‘fellow’ I am required by the Canadian Institute to enforce its strict rules.

### Participation lasers:

Please leave your participation laser in one of the piles at the end of every lecture. I pay for them personally in the hope that you will find the easy participation helpful-but it does mean that if you take them home then it seems a lot like theft to me. Use them as indicated in class to e.g. point to suggested answers, to unclear points, to give your opinion etc. Please don’t laser-slice your neighbours, unless of course they distract you by whispering in lecture!

### Marking Scheme:

Lecture: surprise quizzes	Obligatory attendance. Lectures will be only partially posted on the web. There will be at least five pop-quiz micro-tests in lecture during the term, not announced in advance. Material is usually new that day. For lecture quizzes (only) discussion with other students is OK, but not copying. Up to two can be missed without penalty. Graded 7-10. In the past, students detected doing quizzes for absent friends have been failed in the course, along with the friends.	5%
Tutorials: assignment verifications	Obligatory attendance. Assignment must be done but is not graded. In each tutorial for which an assignment is due, a verification quiz on at least one assignment question, perhaps slightly modified, will be given. This is intended as verification that you did the assignment so no help from other students allowed. Up to two can be missed without penalty. Graded 7-10.	5%
Test 1	Multiple choice; 40% of questions are modified from assignments	20%
Test 2	Multiple choice; 40% of questions are modified from assignments; concentrates on material since test 2	20%
Final	Multiple choice, on entire term, no 40% guarantee	50%

If you miss more than two in-lecture surprise quizzes and/or two tutorial verification quizzes, and claim medical reasons, you will need to show medical certificates for all missed quizzes, including the ‘giftie’ first two. Weightings will not be changed, either for the whole class or (for fairness to the whole class) for any individuals.

### Medical certificates are carefully and skeptically investigated in accordance with University regulations:

A few years ago, 20 out of every 100 students would produce doctors’ certificates. Now University policy is very strictly interpreted and very strictly enforced. Medical certificates must be signed by an Ontario-registered MD, with registration number and phone number, and the date of certificate relative to claimed sickness must be within the limit imposed by University rules. It is essential that the doctor specifically indicates that in his/her opinion there was a disabling health problem on the day of the test. Certificates saying “needs rest” or “respiratory tract infection” or “injured foot” or similar will be rejected, as will certificates from chiropractors and acupuncturists. The doctor should be contactable by us for verification. It is expected that each student with accepted documentation will be required to take a rigorous make-up test at a chalkboard. If documentation is not provided or is not accepted, your test mark for the missed test will be zero. Note that no excuses, medical or otherwise, are accepted by the Society of Actuaries or CFA Institute if a professional exam is missed.

### GOOD LUCK

Any omissions/suspected errors please email to me at [sharp@utstat.utoronto.ca](mailto:sharp@utstat.utoronto.ca)