

ACT247 – Introductory Life Contingencies

Vital Statistics:

Instructor: Professor V. Zhang

Lectures: Thursdays, 10am-12pm

Lecture location: SS 2118

Tutorials: Tuesdays, 10-11am

Tutorial Location: TBD (will be posted on Blackboard)

Office: 6th floor, SS Room 6027A

Office Hour: Thursdays, 1-3pm

Blackboard: <http://portal.utoronto.ca>

Email: vickijing.zhang@utoronto.ca

Textbook:

The main course book we will use for this course is Sam Broverman's Study Guide for SOA EXAM MLC, 2015 or 2016 edition. The Actuarial Club has made cheap version of the 2016 edition available. Detailed textbook purchase information from the Actuarial Club will be posted on the course portal.

We introduce a character Sussie Lin and follow her "layman to expert" journey of understanding life insurance and annuities. The course materials have been reordered to follow the many turns of her story. Every week I will post the readings from Broverman manual that are relevant to that week's lecture (and narrative advancement). So please pay special attention to the course website, and join us for the ride!

A useful reference book (on Course Reserve at Robarts library):
Actuarial Mathematics, by Newton Bowers, et al.

Calculator:

You need one of the following SOA-approved calculators: 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)

Evaluation:

10% Excel Homework

25% Term Test 1

25% Term Test 2

40% Final Exam

Bonus points opportunities (to be applied to final course mark):

In-class questions using Poll Everywhere (up to 5% bonus points): For each question that is answered correctly, you are awarded 0.5 point. All participation is voluntary but strongly recommended. Bonus points will be awarded and accumulated from week 3 (although I will only post the total bonus points at semester's end).

Estimated Weekly Schedule of Topics:

Lecture – January 5: (section 2)

- Introducing Susie Lin, whose journey of understanding life insurance we will follow intently throughout the course
- Types of life insurance
- How to conduct a cost/benefit analysis for different life insurance?
 - o Introduce time-until-death variable T_x , survival function
- Poll Everywhere test run

First tutorial will be on Tuesday, January 10th.

Lecture – January 12: (section 2, 3)

- Survival function - continued
- What Benjamin Gompertz discovered two hundred years ago?
 - o Force of mortality
- Linking force of mortality with survival function

Lecture - January 19: (section 6, 5)

- Parametric survival models: what's the implication for Sussie if those were her survival models?
- Sussie's life expectancy (and other statistics – variance, percentile, etc)

Lecture – January 26: (section 12, 13)

- Cost of different types of insurance – continuous case
- Different definitions of insurance cost
- Recursive relationships

Tutorial January 31 – Term test 1 (55 minutes, 10:05-11am), covering materials up to “life expectancy and other statistics”

Lecture – February 2: (section 4, 5)

- Life table
- Curtate time-until-death variable K_x
- Sussie's life expectancy using K_x (and other statistics)
- Linking life table with survival functions

Tutorial February 7 – Term test 1 review with TA

Lecture – February 9: (section 9, 10, 11,13)

- Cost of different types of insurance – discrete case
- Recursive relationships

Lecture – February 16: (Section 7, 13)

- Life insurance with varying benefits – discrete case
- Relationships between continuous and discrete case of life insurance pricing

February 23: Reading week, no class.

Lecture – March 2: (Section 8, 13)

- Select life table
- Cost of group insurance

Lecture – March 9: (Section 16, 17)

- Sussie's legacy – annuities introduction; different types of annuities
- Cost of different types of annuities – continuous case

March 13: Last day to drop class.

Tutorial March 14 – Term Test 2 (55 minutes, 10:05-11:05am), covering materials up to “cost of group insurance”

Lecture – March 16: (Section 16, 17)

- Cost of different types of annuities – continuous case (Continued)
- Recursive relationship

Tutorial March 21 – Term Test 2 Review with TA

Lecture – March 23: (Section 14, 15, 13)

- Cost of different types of annuities – discrete case
- Monthly payment insurance and annuities (homework)

Lecture – March 30: (Section 13, 17, 15)

- Homework recap
- Theoretically prove formula for monthly payment insurance (Sec 13) and annuities (Sec 17)
- Annuities with varying benefits
 - o A mini-case on loan and mortgage insurance
- Loose ends

NO tutorial in the last week

Final Exam – Date TBA, will be announced on portal

Missed Assignments or Exams

- There is **no** make-up for in-class quizzes or bonus questions.
- There is **no** make-up for homework project.
- There are **no** make-up term tests. However, if you miss a term test, and you can provide me with one of the following: a UofT Verification of Illness or injury form (www.illnessverification.utoronto.ca), or an Accessibility Services letter, or a letter from your college registrar about personal matters interfering with your studies, **by the day after the term test at the latest**, your missed term test weight will be shifted to the final exam (i.e. if you missed a 25% term test, your final exam will be worth 65%).

- There will be **ONE** make-up final exam arranged by Faculty of Arts and Science directly.

Canadian Institute of Actuaries (CIA)'s University Accreditation Program (UAP)

ACT247 is an accredited course under the UAP program. The minimum grade needed to apply for an exemption is 70. For detailed information on UAP, please visit the following webpages:

- University Accreditation Program description (<http://www.cia-ica.ca/membership/uap>)
- List of accredited courses offered by University of Toronto: <http://www.cia-ica.ca/membership/uap/accredited/toronto>
- How to apply for CIA exemptions: <http://www.cia-ica.ca/membership/uap/information-for-students>

Note: The CIA will grant credits to students for SOA/CAS examinations based on the achievement of the minimum Grade towards Associateship (ACIA) and Fellowship (FCIA) in the CIA. At the time of this agreement, CIA credits are recognized by the following actuarial organizations towards their respective designations:

Casualty Actuarial Society (CAS): ACAS, FCAS

UK Institute and Faculty of Actuaries (IFoA): FIA, AIA

Institute of Actuaries of Australia (IAA): AIAA, FIAA

Actuarial Society of South Africa (ASSA): AMASSA, FASSA

American Academy of Actuaries (AAA): MAAA

The CIA does not guarantee that credits granted to students under the CIA UAP will be recognized by any other actuarial organizations towards their actuarial designations.