

ACT247H1 Introductory Life Contingencies
Course Syllabus
Winter 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 'ACT247' in the subject line)
- Lectures : Thursday 11:00 - 13:00, either delivered online through 'Bb Collaborate' or pre-recorded. The first lecture is on January 14th and the last lecture is on April 8th.
- Tutorials: Tuesday 10:00 - 11:00, delivered online. No tutorial during the first week.
- TAs:
 - Tutorial session 0101 (last name A-H): Sebastian Calcetero (sebastian.calcetero@mail.utoronto.ca)
 - Tutorial session 0102 (last name J-P): Tunan Jia (tunan.jia@mail.utoronto.ca)
 - Tutorial session 0103 (last name Q-Z): TBD
- Office hour: Thursday 13:00 - 14:00 or by appointment, conducted online through 'Bb Collaborate'.

Course Description:

Probability theory applied to survival and to costs and risks of life assurances, life annuities, and pensions; analysis of survival distributions; international actuarial notation.

Pre-requisites

ACT240H1; MAT137Y1 (minimum grade 63%)/MAT157Y1 (minimum grade 60%); STA257H1

Course Material:

Required:

- Actuarial Science Coursebook for ACT247+ACT348 by Prof. Sam Borverman
- Calculator: A financial calculator (e.g. Texas Instruments BA35, BA II Plus, BA II Plus Professional, TI30Xa, TI30X II, TI-30X MultiView)

Other useful references:

- *Actuarial Mathematics for Life Contingent Risks, 3rd Edition* by Dickson, C.M.D., Hardy, M.R., Waters, H.R., (2020), Cambridge University Press
- Society of Actuaries (SOA) Exam LTAM website:
<https://www.soa.org/education/exam-req/edu-exam-ltam-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 ¹:

- Jan 14th: Lecture 1
 - Course Overview
 - Section 2: Models for Survival and Mortality
- Jan 21st: Lecture 2
 - Section 3: The Force of Mortality
 - Section 5: Mean and Variance of T_x and K_x
- Jan 28th: Lecture 3
 - Section 4: The Life Table
 - Section 8: Select and Ultimate Mortality
- Feb 4th: Lecture 4
 - Section 6: Parametric Survival Models
 - Section 7: Fractional Age Assumptions
- Feb 9th: **Term Test 1 (Section 2-7)**
- Feb 11th: Lecture 5
 - Section 9: One-Year Term Insurance Payable at the End of the Year of Death
 - Section 10: Term and Whole Life Insurance Payable at the End of the Year of Death
- Feb 18th: Reading Break
- Feb 25th: Lecture 6
 - Section 11: Pure Endowment and Other Life Insurances Payable at the End of the Year of Death

¹This 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.

- Mar 4th: Lecture 7
 - Section 12: Insurance Payable at the Moment of Death
- Mar 11th: Lecture 8
 - Section 13: Additional Insurance Relationships
- Mar 16th: **Term Test 2 (Section 8-13)**
- Mar 18th: Lecture 9
 - Section 14: Discrete Whole Life Annuity-Due
- Mar 25th: Lecture 10
 - Section 15: Discrete Life Annuities
- Apr 1st: Lecture 11
 - Section 16: Continuous Life Annuities
- Apr 8th: Lecture 12
 - Section 17: Additional Annuity Relationships

Evaluation:

There will be four pop-up in-tutorial quizzes (15 minutes), two in-tutorial midterm tests (50 minutes) 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

Missed Quizzes or Tests:

- Quizzes:
 - No marks will be given to missed quizzes.
 - There will be no make-up quizzes.
- Mid-term test:
 - If you miss a mid-term test for a valid reason, then you **must** notify the instructor (also cc your TA) and explain the reason ² via email **within 24 hours** of the time of the test. The weight of the missed mid-term test will then be shifted to the final exam. Fail to notify the instructor on time will result a zero mark for the missed test.
 - The following sentences must be included in the email:

²and record your absence through the ACORN online absence declaration

- * “I affirm that I am experiencing an illness or personal emergency and I understand that to falsely claim so is an offence under the Code of Behaviour on Academic Matters.”
- * “I understand that the weight of this mid-term test will be shifted to the final exam.”
- There will be no make-up mid-term tests.
- Final exam (final assessment):
 - 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. Due to the online testing format and the deferral, the make-up final exam **may be more difficult** than the missed final exam and it may contain an oral examination part.

Other Issues

- **Time-zone issue.** If you are taking this course at a place that is in a different time zone which prevents you from taking the tests (quizzes, mid-term tests, and final exam) at the scheduled times, then you may be allowed to take those tests at other time slots. However, you need to contact the instructor (also cc your TA) during the first week of the semester in order to make this arrangement.
- **Technical issue.** Technical failures may occur during the test time. If you encounter technical issues during the tests, you must notify the instructor (also cc your TA) immediately (e.g., using your cell-phones) with the details of the technical issues and make follow-up arrangements accordingly.

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

ACT247 is an accredited course under the UAP program. You may apply for a credit for Exam LTAM if you achieve the minimum grades for the following three courses: ACT247, ACT348, ACT455. The minimum grade required for ACT247 is 70. For detailed information on UAP, please visit the following webpages: https://www.cia-ica.ca/membership/university-accreditation-program-home/accredited-universities/accredited-university-detail?pav_universityid=06f6b138-61e5-e511-80b9-00155d111030

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.

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.

Copyright

You are **NOT** allowed to share the lecture notes, lecture recordings, quizzes, term tests and final exam material in any form to any third party that is outside of this class. Distributing these materials is considered as a copyright violation and an academic offence. If caught, student who violates this copyright agreement will be subject to disciplinary actions under the Code of Student Conduct.