

The University of Western Ontario
Department of Statistical and Actuarial Sciences

AS 2427B Life Contingencies I

Course Outline – January 2019

1. Course Information

Course Description: Models for the time until death, single life annuity and life insurance present values and their probability distributions

Prerequisites: AS 2553A/B, Stats 2857A/B, and Cal 2402A (or Cal 2502 + 2503) with a minimum grade of 60% in each of these courses

Anti-requisites: The former Actuarial Science 3429 A/B or 3431 A/B

Warning: Unless you have either the requisites for this course or written special permission from your Dean to enroll in it, you may be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.

Lecture Hours and Location: Mon, Wed, and Fri. 12:30pm – 1:30pm TC 141
Tutorial Hour: Tuesdays 2:30pm – 3:30pm TC 141

2. Instructor Information

Instructor: Shu Li

Office: WSC 229

Email: shu.li@uwo.ca

Phone: 519-661-2111 ext 85419

Instructor office hours: Tuesdays 12:30pm – 2:20pm, Fridays 10:30am – 11:30am

Teaching Assistant: Ruixi Zhang

Email: rzhan56@uwo.ca

TA office hours: TBD

3. Course Syllabus and Objectives

Textbook: *Actuarial Mathematics for Life Contingent Risks (AMLCR)* by Dickson, C.M.D., Hardy, M.R., and Waters, H.R., 2013, **Second Edition**.

A solutions manual for the Actuarial Mathematics text has been published and this can be purchased online from Amazon.

We will cover Chapters 1 to 5 and Chapter 6 Sections 6.1 to 6.5 of the ALMCR text including the following topics:

- Chapter 1 Introduction to life insurance
 - Brief introduction on the terminology and major types of life insurance, annuity and pension contracts
- Chapter 2 Survival models
 - Future life time random variable, survival function, force of mortality, international actuarial notation (IAN), expected complete and curtate future lifetime
- Chapter 3 Life Tables and Selection
 - Life tables, fractional age assumptions, life insurance, survival models, select & ultimate models, mortality trends
- Chapter 4 Insurance Benefits
 - IAN and EPV (& variance) calculations for various types of life insurance with different death benefit payout timing assumptions
- Chapter 5 Life Annuities
 - IAN and EPV (& variance) calculations for various types of life annuities that are paid at different frequency
- Chapter 6 Premium Calculation
 - EPV (& variance) of net future loss random variable, equivalence principle for net premium calculation

The course material supports part of the Learning Objectives/Outcomes from **SOA Long-Term Actuarial Mathematics Exam (LTAM)** Syllabus.

4. Course Website Information

Students should check OWL (<http://owl.uwo.ca>) on a regular basis for lecture notes, announcements and updates. This is the primary method by which information will be disseminated to all students in the class. Students are responsible for checking OWL on a regular basis.

5. Methods of Evaluation

Quizzes: There will be **four 30-minute quizzes** to be held during the Tuesday tutorial timeslot on the following dates: **Tuesday January 22, February 26, March 19 and April 2**. Each quiz will consist of a few short answer questions on recently covered lecture topics.

Midterms or Tests: There will be **two one-hour tests** held during the tutorial time. Test 1 will be on **Tuesday February 5**. Test 2 will be on **Tuesday March 12**.

Final Exam: A three-hour final exam will be scheduled by the Registrar's Office in the final examination period.

Calculators: Any non-programmable calculator may be used in this course.

The overall course grade will be calculated as listed below:

Quizzes (4)	20%
Test 1	15%
Test 2	15%
Final Exam	50%

6. Canadian Institute of Actuaries Actuarial Exam Accreditation

This course is accredited under the Canadian Institute of Actuaries (CIA) University Accreditation Program (UAP) for the 2018-2019 academic year. Achievement of the established exemption grade in this course may qualify a student for exemptions from writing certain preliminary exams. Please note that a combination of courses may be required to achieve a single exemption. See <http://www.cia-ica.ca/membership/university-accreditation-program---home/information-for-candidates> for full details.

7. Accommodation and Accessibility

If you are unable to meet a course requirement due to illness or other serious circumstances, you must provide valid medical or supporting documentation to the Academic Counselling Office of your home faculty as soon as possible. If you are a Science student, the Academic Counselling Office of the Faculty of Science is located in NCB 280, and can be contacted at scibmsac@uwo.ca.

For further information, please consult the university's medical illness policy at http://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_medical.pdf.

If you miss the Final Exam, please contact your faculty's Academic Counselling Office as soon as you are able to do so. They will assess your eligibility to write the Special Exam (the name given by the university to a makeup Final Exam). For those that are approved by their faculty to write a special exam, a "Recommendation of Special Examination Form" will be provided to the student (by their faculty) and the student must then follow-up on the completion of this form directly with their instructor.

You may also be eligible to write the Special Exam if you are in a "Multiple Exam Situation" (see http://www.registrar.uwo.ca/examinations/exam_schedule.html).

Missed Midterm or Test: The policy of the department of Statistical and Actuarial Sciences is that there will be **no make-up exams** for a missed midterm. For those that do legitimately miss a midterm and provide the required supporting documentation, the standard practice will be that the weight of the midterm will be reassigned to the final exam. If your reason is not deemed valid, then you will receive a mark of 0.

8. Email Communication

You are welcome to communicate with your instructor by email, but email communication should only be used to provide them with information or ask a question that requires a *brief* response. For more lengthy discussions and for discussions on lectures/course material, please see your instructor during their scheduled office hours or by appointment. Students must use their Western (@uwo.ca) email addresses when contacting their instructors. Only emails sent from your UWO account will be read (as emails sent from other addresses often get spammed).

9. Academic Policies

The website for Registrarial Services is <http://www.registrar.uwo.ca>.

In accordance with policy, <http://www.uwo.ca/its/identity/activatenonstudent.html>, the centrally administered e-mail account provided to students will be considered the individual's official university e-mail address. It is the responsibility of the account holder to ensure that e-mail received from the University at his/her official university address is attended to in a timely manner.

Cell phones and all other electronic devices are prohibited during tests, quizzes and exams.

Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site: http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf.

10. Support Services

Please contact the course instructor if you require lecture or printed material in an alternate format or if any other arrangements can make this course more accessible to you. You may also wish to contact Student Accessibility Services (SAS) at 661-2147 if you have any questions regarding accommodations.

The policy on Accommodation for Students with Disabilities can be found here: http://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_disabilities.pdf

The policy on Accommodation for Religious Holidays can be found here: http://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_religious.pdf

Learning-skills counsellors at the Student Development Centre (<http://www.sdc.uwo.ca>) are ready to help you improve your learning skills. They offer presentations on strategies for improving time management, multiple-choice exam preparation/writing, textbook reading, and more. Individual support is offered throughout the Fall/Winter terms in the drop-in Learning Help Centre, and year-round through individual counselling.

Students who are in emotional/mental distress should refer to Mental Health@Western (http://www.health.uwo.ca/mental_health) for a complete list of options about how to obtain help.

Additional student-run support services are offered by the USC, <http://westernusc.ca/services>.

11. Classroom Environment

The Department has adopted a "Mutual Expectations" policy governing the classroom environment and all work submitted by students. The full text of the policy can be found at: <http://www.uwo.ca/stats/undergraduate/mutual-expectations.html>. In summary, the policy was developed under the premise that all interactions between students and faculty should be governed by the principles of courtesy, respect and honesty.

Computers and other technical devices are to be used only for note taking purposes during class and cell phones should be turned off/on mute.