

The University of Western Ontario
Department of Statistical and Actuarial Sciences

AS3429A/AS9429A Section 001

Life Contingencies II

W2017 Course Outline

Instructor Information

Instructor: Mary Millard

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Office Hours Mon, Thu 1:30-3:00

Course Information

Course Description

Single life annuity and life insurance loss random variables and their distributions, with applications to the analysis of benefit premiums and reserves.

Prerequisites: A minimum mark of 60% in each of Actuarial Science 2427A/B and Statistical Sciences 2858A/B.

Co requisites: Statistics 3657A/B

Warning: Unless you have either the pre-requisites for this course or written special permission from your Dean to enrol in it, you may be removed from this course and it will be deleted from your record. You can be deregistered at any time even after writing the final exam. 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. 10:30 AM-11:30 AM WSC 240;

Book Information

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

A solutions manual for the Actuarial Mathematics text has been published and this can be purchased online at Amazon. The authors have also published excel spreadsheets for some of the text questions and these can be accessed and downloaded from the Resources section found at:

<http://www.cambridge.org/ca/academic/subjects/statistics-probability/statistics-econometrics-finance-and-insurance/solutions-manual-actuarial-mathematics-life-contingent-risks-2nd-edition>

Calculators:

Any non-programmable calculator may be used in this course

Course Objectives

We will review material from Life Contingencies I and will then cover chapters 6, 7 and 11.1-11.4 of the *ALMCR* text. As time permits, we may also cover some Introduction to Pension funding and other topics.

The course material supports the following Learning Objectives/Outcomes from SOA Exam MLC Syllabus

- Understand benefit reserves and calculate benefit reserves for traditional life insurances and annuities. For single decrement on single life models:
 - Calculate moments of the loss-at-issue random and future-loss random variables
 - State the equivalence principle
 - Calculate the benefit reserve and premium
- Understand the relationship between expenses and gross premium for traditional life insurance and annuities. For single decrement single life models:
 - Calculate an expense factor using the appropriate exposure
 - Calculate probabilities and moments of the present-value-of expense random variable
 - Calculate the expense reserve
 - Calculate a gross premium given expenses and benefits based on: the equivalence principle: and a return on gross profits basis
 - Calculate the gross premium reserve
 - Calculate the asset share
- Understand the non-stochastic interest rate models used to calculate present values and accumulated values of cash flows and calculate present values and accumulated values of cash flows.

Assessment

Assignments and/or Quizzes: There will be **4 in class quizzes** held at the beginning of class on the following dates: **Fri. Sept 22nd, Fri. Oct. 6th, Mon. Nov.13 and Mon. Nov 27th**

Each 25 minute quiz will consist of a few questions on recently covered lecture topics.

Midterms or Tests: There will be a **two hour midterm on Thursday October 26th**. The time (tentatively set for 5-7) and the location is to be finalized.

Final Exam: A 3 hour cumulative final exam will be scheduled in the final examination period.

Evaluation: Your course grade will be determined as follows:

Quizzes	20%
Midterm	30%
Final Exam	50%

Course Website Information:

Sakai/OWL will be used for this course. Please check this webpage regularly for lecture notes, and announcements. The course outline is also posted.

Canadian Institute of Actuaries Actuarial Exam Accreditation

This course is accredited under the Canadian Institute of Actuaries (CIA) University Accreditation Program (UAP) for the 2017-2018 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. Please see <http://www.cia-ica.ca/membership/uap/information-for-students> for full details.

Department Policy on Missed Course Requirements and Student Health and Wellness

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 WSC 140, and can be contacted at scibmsac@uwo.ca. If accommodation is approved by your Dean's office, your instructor will be notified, and it is your responsibility to make alternative arrangements with your instructor.

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.

Student Health and Wellness: As part of a successful student experience at Western, we encourage students to make their health and wellness a priority. Western provides several on campus health-related services to help you achieve optimum health and engage in healthy living while pursuing your degree. For example, to support physical activity, all students, as part of their registration, receive membership in Western's Campus Recreation Centre. Numerous cultural events are offered throughout the year. Please check out the Faculty of Music web page <http://www.music.uwo.ca/>, and our own McIntosh Gallery <http://www.mcintoshgallery.ca>. Information regarding health- and wellness-related services available to students may be found at <http://www.health.uwo.ca/>.

Students seeking help regarding mental health concerns are advised to speak to someone they feel comfortable confiding in, such as their faculty supervisor, their program director (graduate chair), or other relevant administrators in their unit. Campus mental health resources may be found at http://www.health.uwo.ca/mental_health/resources.html.

To help you learn more about mental health, Western has developed an interactive mental health learning module, found here: http://www.health.uwo.ca/mental_health/module.html. This module is 30 minutes in length and provides participants with a basic understanding of mental health issues and of available campus and community resources. Topics include stress, anxiety, depression, suicide and eating disorders. After successful completion of the module, participants receive a certificate confirming their participation.

Accessibility: 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 Services for Students with Disabilities (SSD) at 661-2111 ext. 82147 if you have questions regarding accommodation.

Support Services: Learning-skills counsellors at the Student Development Centre (SDC) (<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. Additional student-run support services are offered by the USC, <http://westernusc.ca/services>. The website for Registrarial Services is <http://www.registrar.uwo.ca>.

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 to 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. Only e-mails sent from your UWO account will be read (as emails sent from other addresses often get spammed).

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 this website: http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf.

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.