

## AS 3431 Long Term Actuarial Math III Course Outline

### 1. Course Information

#### Course Information

**Course name:** AS 3431B - Long Term Actuarial Math III  
**Academic Term:** Winter 2024  
**Lecture hours and location:** MWF 8:30am - 9:30am, WSC 240

#### List of Prerequisites

**Prerequisites:** A minimum mark of 60% in each of Actuarial Science 3429A/B and in Statistical Sciences 3657A/B. Restricted to students enrolled in any Actuarial Science module.

Unless you have either the requisites for this course or written special permission from your Dean's Designate (Department/Program Counsellors and Science Academic Counselling) 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.

### 2. Instructor Information

Instructors	Email	Office	Phone	Office Hours
Dr. Shu Li (Instructor & Course Coordinator)	shu.li@uwo.ca	WSC 229	5196612111 ext. 85419	
(Teaching assistant)				

Students must use their Western (@uwo.ca) email addresses when contacting their instructors, and indicate the course number (AS 2427) in the subject line. We strive to answer all emails within 2 business days.

### 3. Course Syllabus, Schedule, Delivery Mode

**Course Description:** Analysis of probability distributions and present values associated with multiple life models, multiple decrement models and more general multi-state models and applications to life Insurance and other long term coverages including disability Income and other health care coverages.

**Learning Outcomes:** The course material supports part of the Learning Objectives/Outcomes from SOA Exam ALTAM–Advanced Long-Term Actuarial Mathematics Syllabus.

Type	Mode	Dates	Time	Frequency
Lecture	In-person	MWF	8:30am - 9:30am	weekly

### Key Sessional Dates

Classes begin: January 8, 2024;  
 Spring Reading Week: February 17 – February 25, 2024;  
 Classes end: April 8, 2024;  
 Exam period: April 11 – 30, 2024.

### Contingency plan

Although the intent is for this course to be delivered in person, should any university-declared emergency require some or all of the course to be delivered online, either synchronously or asynchronously, the course will adapt accordingly. The grading scheme will **not** change. Any assessments affected will be conducted online as determined by the course instructor.

## 4. Course Materials

**Textbook:** Actuarial Mathematics for Life Contingent Risks (AMLCR) by Dickson, C.M.D., Hardy, M.R., and Waters, H.R., 2020, **Third Edition**. Cambridge University Press.

- Chapter 8 Multiple state models
- Chapter 9 Multiple decrement models
- Chapter 10 Joint life and last survivor benefits
- Chapter 11 Pension mathematics
- Chapter 13 Emerging costs for traditional life insurance (except section 8)

If time permits, we will continue to cover:

- Chapter 14 Universal life insurance
- Chapter 15 Emerging costs for equity-linked insurance (sections 1-3)
- Chapter 17 Embedded options

A solutions manual for the AMLCR text is also available.

Students may find the textbook and its solution manual from their Personal Textbook list, or through the following direct link to the resources from Western Bookstore.

[https://bookstore.uwo.ca/textbook-search?campus=UWO&term=W2023A&courses%5B0%5D=001\\_UW/ASC3429A](https://bookstore.uwo.ca/textbook-search?campus=UWO&term=W2023A&courses%5B0%5D=001_UW/ASC3429A)

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

All course material will be posted to OWL: <http://owl.uwo.ca>.

If students need assistance with the course OWL site, they can seek support on the OWL Help page. Alternatively, they can contact the Western Technology Services Helpdesk. They can be contacted by phone at 519-661-3800 or ext. 83800.

### **Technical Requirements**

In the case of having to move the course to online platform, Zoom will be used to conduct synchronous online lectures.

## **5. Methods of Evaluation**

The overall course grade will be calculated as listed below:

<b>Tests (2)</b>	<b>40% (20% each)</b>
<b>Final Exam</b>	<b>60%</b>

**Tests:** There will be two 50-minutes tests held in-class, on **Fridays February 9 and March 15**.

**Final Exam:** A 3-hour final exam will be scheduled by the Registrar's Office in the final examination period.

**Specific conditions that are required to pass the course:**

- a minimum 20% of the evaluations must be completed before the final exam.

**Note:** All the evaluations are closed book.

**Note:** Students only have one week to request remarking their quizzes or tests after the papers are distributed back.

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

**Practice questions:** Suggested practice questions will be posted on OWL. Assistance with solving them may be obtained during the instructor's and TA's office hours.

## **6. University Accreditation Program – Canadian Institute of Actuaries (CIA)**

This course is part of the University Accreditation Program meeting certain requirements by the Canadian Institute of Actuaries. Please consult the CIA website for full details on CIA accreditation.

## 7. Student Absences

If you are unable to meet a course requirement due to illness or other serious circumstances, please follow the procedures below.

**Assessments worth less than 5% of the overall course grade:** Does not apply to this course.

**Assessments worth 5% or more of the overall course grade:**

For work totalling 5% or more of the final course grade, you must provide valid medical or supporting documentation to the Academic Counselling Office of your Faculty of Registration as soon as possible. For further information, please consult the University's medical illness policy at

[https://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/accommodation\\_medical.pdf](https://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_medical.pdf).

The Student Medical Certificate is available at

[https://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/medicalform.pdf](https://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf).

**Missed Quiz or Test:** The policy of the department of Statistical and Actuarial Sciences is that there will be **no make-up exams** for a missed quiz/test. 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.

### Absences from Final Examinations

If you miss the Final Exam, please contact the Academic Counselling office of your Faculty of Registration as soon as you are able to do so. They will assess your eligibility to write the Special Examination (the name given by the University to a makeup Final Exam).

You may also be eligible to write the Special Exam if you are in a "Multiple Exam Situation" (e.g., more than 2 exams in 23-hour period, more than 3 exams in a 47-hour period).

If a student fails to write a scheduled Special Examination, the date of the next Special Examination (if granted) normally will be the scheduled date for the final exam the next time this course is offered. The maximum course load for that term will be reduced by the credit of the course(s) for which the final examination has been deferred. See the Academic Calendar for details (under [Special Examinations](#)).

**Note:** missed work can *only* be excused through one of the mechanisms above. Being asked not to attend an in-person course requirement due to potential COVID-19 symptoms is **not** sufficient on its own.

## 8. Accommodation and Accessibility

### Religious Accommodation

When a course requirement conflicts with a religious holiday that requires an absence from the University or prohibits certain activities, students should request accommodation for their absence in writing at least two weeks prior to the holiday to the course instructor and/or the Academic Counselling

office of their Faculty of Registration. Please consult University's list of recognized religious holidays (updated annually) at

<https://multiculturalcalendar.com/ecal/index.php?s=c-univwo>.

### **Accommodation Policies**

Students with disabilities are encouraged to contact Accessible Education, which provides recommendations for accommodation based on medical documentation or psychological and cognitive testing. The policy on Academic Accommodation for Students with Disabilities can be found at:

[https://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/Academic\\_Accommodation\\_disabilities.pdf](https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic_Accommodation_disabilities.pdf).

## **9. Academic Policies**

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

In accordance with policy,

[https://www.uwo.ca/univsec/pdf/policies\\_procedures/section1/mapp113.pdf](https://www.uwo.ca/univsec/pdf/policies_procedures/section1/mapp113.pdf),

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 their 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](http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf).

In the case of in-person class pivoting to 100% online learning, tests and examinations in this course will be conducted using a remote proctoring service. By taking this course, you are consenting to the use of this software and acknowledge that you will be required to provide **personal information** (including some biometric data) and the session will be **recorded**. Completion of this course will require you to have a reliable internet connection and a device that meets the technical requirements for this service. More information about this remote proctoring service, including technical requirements, is available on Western's Remote Proctoring website at:

<https://remoteproctoring.uwo.ca>.

## **10. Support Services**

Please visit the Science & Basic Medical Sciences Academic Counselling webpage for information on adding/dropping courses, academic considerations for absences, appeals, exam conflicts, and many other academic related matters: <https://www.uwo.ca/sci/counselling/>.

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

Western is committed to reducing incidents of gender-based and sexual violence and providing compassionate support to anyone who has gone through these traumatic events. If you have experienced sexual or gender-based violence (either recently or in the past), you will find information about support services for survivors, including emergency contacts at

[https://www.uwo.ca/health/student\\_support/survivor\\_support/get-help.html](https://www.uwo.ca/health/student_support/survivor_support/get-help.html).

To connect with a case manager or set up an appointment, please contact [support@uwo.ca](mailto:support@uwo.ca).

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 Accessible Education at

[http://academicsupport.uwo.ca/accessible\\_education/index.html](http://academicsupport.uwo.ca/accessible_education/index.html)

if you have any questions regarding accommodations.

Learning-skills counsellors at the Student Development Centre (<https://learning.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.

Western University is committed to a thriving campus as we deliver our courses in the mixed model of both virtual and face-to-face formats. We encourage you to check out the Digital Student Experience website to manage your academics and well-being: <https://www.uwo.ca/se/digital/>.

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