



Students requiring accommodations as a result of disability, must contact the Centre for Students with Disabilities 604-291-3112 or csdo@sfu.ca

Instructor: [Dr. Yi Lu](#)

**Prerequisite:**

ACMA 320

**Required Text:**

*Actuarial Mathematics* (2nd ed 1997) by Bowers, Gerber, et al.; Society of Actuaries

**References:**

*Life Insurance Mathematics* by Gerber, Springer-Verlag  
*The Mathematics of Life Insurance* by Menge and Fisher; Ulrich's  
*Life Contingencies* by C.W. Jordan; Society of Actuaries

**Calendar Description:**

Actuarial reserves: allocation of the loss to the policy years. Multiple life functions: Joint-life, last-survivor. Multiple decrement models: stochastic and deterministic approaches, associated single decrement, fractional durations. Valuation theory for pension plans. Insurance models including expenses: gross premiums and reserves, type of expenses, modified reserves. Nonforfeiture benefits and dividends: equity concept, cash values insurance options, asset shares, dividends. Covers part of the syllabus for Exam M of the Society of Actuaries, and Exam 3 of the Casualty Actuarial Society. **Quantitative**

**Course Description:**

This course, a continuation of ACMA 320, covers the fundamentals of Actuarial Mathematics.

**Outline:**

The topics covered correspond to part of Exam MLC of the Society of Actuaries and they include:

- **Reserves:**  
Continuous, Discrete, Recursive Formulas, Fractional Durations, Allocation of Loss to Policy Years (Revision).
- **Multiple Life Functions:**  
Joint Life, Last Survivor, Dependent Lifetime Models.
- **Multiple Decrement Models:**  
Random and Deterministic Survivorship Groups, Associated Single Decrement, Multiple Decrement.
- **Introduction to Valuation Theory for Pension Plans:**  
Contributions, Benefits.
- **Models Including Expenses:**  
Types of Expenses, Per Policy Expenses, Accounting, Asset Shares.
- **Multi-State Transition Models:**  
Discrete-Time Markov Chain, Actuarial Applications.

**Grading Scheme:**

Assignments – 10%  
Midterm – 40%  
Final Exam – 50%

*Students should be aware that they have certain rights to confidentiality concerning the return of course papers and the posting of marks. Please pay careful attention to the options discussed in class at the beginning of the semester. Students are reminded that Academic Honesty is a cornerstone of the acquisition of knowledge. Scholarly integrity is required of all members of the University. Please consult the General Guidelines of the calendar for more details.*