MATH 4513/RMBI 4220 Life Contingencies models and insurance risk
Course Outline- Spring 2023-2024

•Instructor(s)

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•Teaching Assistant(s)

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•Meeting Time and Venue

Lectures:
Date/Time: Monday (15:00 - 16:20) and Friday (10:30 – 11:50)
Venue: Room 2302

Tutorials:
Date/Time: Tuesday (19:00-19:50)
Venue: Room 2302

•Course Description

Credit Points: 3
Pre-requisite: ELEC 2600, or ISOM 3540, or MATH 2421, or MATH 2431.
Exclusion: NIL
Brief Information/synopsis:

This is an undergraduate-level one-semester course on life contingencies models and insurance risk. The course also prepares students to take the Exam LTAM (Long-Term Actuarial Mathe- matics) of the Society of Actuaries and the Exam 3L (Models for Life Contingencies and Statistics) of the Casualty Actuarial Society.

•Intended Learning Outcomes

Upon successful completion of this course, students should be able to:

No.	ILOs
1	Understand survival models and survival distributions and life tables.
2	Be able to carry out the calculations related to life benefits: life insurance and life annuity.
3	Conduct calculations related to net premiums.
4	Understand benefit reserves.
5	Understand multiple life functions and multi-state models

•Assessment Scheme

•Examination duration: 3 hrs
•Percentage of coursework, examination, etc.:

Assessment
Assessing Course ILOs

15% by quiz
1, 2, 3, 4
30% by midterm
1, 2, 3
55% by final
1, 2, 3, 4, 5

•The grading is assigned based on students' performance in assessment tasks/activities.

•Student Learning Resources

Recommended textbook:

Study Guide for the Society of Actuaries Exam LTAM by S. Broverman, 2018 edition.

•Teaching and Learning Activities

Scheduled activities: 4 hrs (lectures + tutorials)

•Course Schedule

Keyword Syllabus:

•Survival models and survival distributions, life tables.

•Life insurance: insurance payable at the moment of death, insurance payable at the end of the year of death, other types of life insurance, some related recursive relationship and differential equations.

•Life annuities: continuous life annuities, discrete life annuities.

•Net premiums: fully continuous premiums, fully discrete premiums, other types of premiums and benefits.

•Benefit reserves: fully continuous benefit reserves, fully discrete benefit reserves, benefit reserves on a semi-continuous basis.

•Multiple life functions and multi-state models: joint distribution of future lifetimes, the joint-life status, the last-survivor status, dependent lifetime models, insurance and annuity benefits, special mortality assumptions.