DALHOUSIE UNIVERSITY

Faculty of Science Course Syllabus
Department of *Mathematics and Statistics*
Acsc/Stat 3703
Actuarial Models I
Winter, 2026

Dalhousie University is located in Mi'kma'ki, the ancestral and unceded territory of the Mi'kmaq. We are all Treaty people.

We acknowledge the histories, contributions, and legacies of the African Nova Scotian people and communities who have been here for over 400 years.

Instructor: Bruce Smith bruce.smith@dal.ca

Lectures: MWF 2:30-3:30, Chase 227

Office hours: MW 10:00-11:15 AND 3:30-3:45, Chase 309

Course delivery: In person. Lectures will NOT be recorded.

Course Description: This class builds on the material in STAT 3360 to develop the theoretical basis for construction and evaluation of actuarial models. Topics covered include survival models, probability distributions, deductibles and limits, and aggregate loss models, with application to insurance.

Course Prerequisite: Stat3360, or permission of instructor.

Course Materials

Required textbook: Loss Models: From Data to Decisions (Fifth Edition) by S. A. Klugman, H. J. Panjer and G. E. Wilmot, published by Wiley, 2019 (or Fourth Edition, 2012)

An electronic version of the textbook can be purchased here.

Additional reading: Introduction to Ratemaking and Loss Reserving for Property and Casualty Insurance (Fourth Edition, 2015 or Fifth Edition, 2022) , by Brown and Lennox. This book is

This book is not required, but if you wish to purchase a copy, you may do so here.

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Approximate order of coverage:

1. Random variables, KPW, chapter 2
2. Basic Distributional Quantities, KPW, chapter 3
3. Characteristics of Actuarial Models, KPW, chapter 4
4. Continuous distributions, KPW, chapter 5
5. Discrete distributions, KPW, chapter 6
6. Frequency and severity with coverage modifications, ch 8 of KPW
7. aggregate loss models, section 9.1,9.2,9.3,9.8 of KPW
8. Insurance coverages – chapter 2 of BL
9. Loss reserving – ch 3 of BL
10. Ratemaking – ch 4 of BL
11. Limited fluctuation credibility, ch 16 of KPW

Material in chapters 2-6 of KPW is basic probability material with no particular emphasis on actuarial application. Chapter 9 of KPW is focused on the distribution of sums of a random number of random variables. Chapters 8 and 16 of KPW, and all material in BL are specifically target to short term actuarial applications such as automobile and homeowner's insurance.

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Course Assessment

Component	Weight (% of final grade)	Date
Midterm exam 1	10%	Monday, February 9, in class
Midterm exam 2	10%	Wednesday, March 11, in class
Final exam	40%	(Scheduled by Registrar)
Assignments	*8* assignments totalling 40%,	

Miderm 1 will cover material from chapters 2-6 of KPW. Midterm 2 will include material from chapters 8,9 of KPW, and some material from BL. The final exam will be comprehensive.

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Conversion of numerical grades to Final Letter Grades follows the Dalhousie Common Grade Scale

A+ (90-100)	**B+** (77-79)	**C+** (65-69)	**D** (50-54)
A (85-89)	**B** (73-76)	**C** (60-64)	**F** (<50)
A- (80-84)	**B-** (70-72)	**C-** (55-59)	

Assignments will be posted on the course webpage **here.**

Course Policies

- Assignment solutions are to be submitted to the course brightspace page. Your assignment solutions should be hand written, and then scanned or otherwise processed to produce a single pdf file, with questions answered in the order given, and the pdf file uploaded to the course brightspace page which is located here.
- Late assignments will not be accepted.
- It is expected that each student will write up their assignment independently. Students submitting identical assignments will receive a mark of 0 for that assignment.
- If you are ill on the day of a test, you must advise me of this fact before the test, and you will need to submit a Student Declaration of Absence form before you can write a make-up test.

link to University Policies and Statements

link to Student Resources