

SPRING 2019 - ACMA 490 D100

**SELECTED TOPICS IN ACTUARIAL SCIENCE (3)**  
**Stoch. Analysis of Insurance Portfolio**

Class Number: 3401 Delivery Method: In Person

**COURSE TIMES + LOCATION:**

Tu 12:30 PM – 2:20 PM

AQ 5008, Burnaby

**INSTRUCTOR:**

Gary Parker

gparker@sfu.ca

1 778 782-4818

Office: SC-K10562

**PREREQUISITES:**

Dependent on the topic covered.

## Description

**CALENDAR DESCRIPTION:**

The topics included in this course will vary from term to term depending on faculty availability and student interest.

**COURSE DETAILS:**Selected Topic: **Stochastic Analysis of Insurance Portfolios****Pre-requisite:**

ACMA 320 &amp; permission of the instructor

**Course Description:**

Life insurance models. Interest rate models for life insurance: time series, stochastic differential equations, estimation. Portfolios of identical policies. Diversified portfolios.

**Outline:**

Basic model for studying life insurance contracts

Models for the Rate of return:

&gt;Time Series; ARMA models

&gt;Stochastic Differential Equations; Ito's formula, log-normal model, Ornstein-Uhlenbeck process, Cox-Ingersoll-Ross model, Principle of covariance equivalence

&gt;Other models: Regime-switching model, Wilkie model

Insurance risk: One contract, A portfolio of identical contracts

Life Insurance with Random Interest and Mortality: Present value, net single premium

Portfolio of Policies with Random Interest and Mortality: moments

Distribution of the Present Value of Benefits for a Portfolio

&gt;Approximating the Distribution; Limiting Portfolio

## Diversified portfolios

## Grading

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Assignments & Term Project	30%
Midterm	30%
Final	40%

## NOTES:

***All grading is subject to change.***

## Materials

## RECOMMENDED READING:

*Stochastic Analysis of Insurance Portfolios*, G. Parker, 2019

## DEPARTMENT UNDERGRADUATE NOTES:

**Students with Disabilities:**

Students requiring accommodations as a result of disability must contact the Centre for Accessible Learning 778-782-3112 or [csdo@sfu.ca](mailto:csdo@sfu.ca)

**Tutor Requests:**

Students looking for a Tutor should visit <http://www.stat.sfu.ca/teaching/need-a-tutor-.html>. We accept no responsibility for the consequences of any actions taken related to tutors.

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Each student is responsible for his or her conduct as it affects the University community. Academic dishonesty, in whatever form, is ultimately destructive of the values of the University. Furthermore, it is unfair and discouraging to the majority of students who pursue their studies honestly. Scholarly integrity is required of all members of the University. <http://www.sfu.ca/policies/gazette/student/s10-01.html>

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