

SPRING 2016 - ACMA 395 D100

**SPECIAL TOPICS IN ACTUARIAL SCIENCE (3)***Class Number: 9037 Delivery Method: In Person***COURSE TIMES + LOCATION:**

Tu 1:30 PM – 2:20 PM

BLU 10031, Burnaby

Th 12:30 PM – 2:20 PM

BLU 10031, Burnaby

**EXAM TIMES + LOCATION:**

Apr 22, 2016

8:30 AM – 11:30 AM

AQ 5014, Burnaby

**INSTRUCTOR:**

Cary Tsai

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778-782-7044

Office: SC-K10563

**PREREQUISITES:**

Dependent on the topics covered.

## Description

**CALENDAR DESCRIPTION:**

Topics in areas of actuarial science not covered in the regular certificate curriculum of the department.

**COURSE DETAILS:****Course Topic: Mortality Models****Pre-requisite:** ACMA 320**Outline:**

## 1. MEASURES OF MORTALITY AND FERTILITY.

- Crude rates.
- Age-specific mortality rates.
- Adjusted measures of mortality.
- Measures of infant mortality.
- Age-specific fertility rates.

## 2. STATIONARY POPULATION THEORY.

- Definitions: stationary population,  $L_x$ ,  $T_x$ ,  $Y_x$ .
- Analysis of the survivorship group.
- Characteristics of stationary populations.
- The Lexis diagram.
- Applications.

### 3. STABLE POPULATION THEORY.

- The Sharpe-Lotka theorem.
- The characteristic equation (or renewal equation).
- The growth rate.
- Applications.
- Quasi-stable populations.

### 4. POPULATION PROJECTIONS.

- Inter-censal and immediate post-censal estimates.
- \* Linear interpolation; Polynomial interpolation; Geometric modeling.
- The logistic curve.
- The component method.

### 5. MORTALITY PROJECTION MODELS

- The Lee-Carter model.
- The CBD model.
- The linear relational model.

### 6. MORTALITY GRADUATION METHODS

- The moving weighted average method.
- The Whittaker-Henderson method.
- The smooth junction interpolation method.

## Grading

Assignments	10%
Term Project	20%
Midterm 1	35%
Midterm 2	35%

## Materials

### REQUIRED READING:

**Introduction to Mathematics of Demography, 3rd ed.** by Robert L. Brown. Publisher ACTEX

ISBN: 1566982057

### DEPARTMENT UNDERGRADUATE NOTES:

#### Students with Disabilities:

Students requiring accommodations as a result of disability must contact the Centre for Students with Disabilities 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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