ACTL30001
Actuarial Modelling I

SUBJECT GUIDE

Semantic 1, 2015

Prepared by
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Centre for Actuarial Studies
Department of Economics
Faculty of Business and Economics
Subject Outline

Subject Aims

The major aim of this subject is the modelling of mortality. We will also cover multiple state models that are useful for modelling life insurance products. The subject finishes with a brief discussion of Poisson processes.

The completion of this subject and ACTL30002 Actuarial Modelling II with a good performance in all exams will lead to exemption from professional exam CT4.

Textbook

*Actuarial Mathematics for Life Contingent Risks*, by Dickson, Hardy & Waters. (We will only use 3 chapters, but the book also covers the material for ACTL30003 Contingencies.)

Learning Outcomes

Subject Objectives

To view the subject objectives and the generic skills you will develop through successful completion of this subject, see the University Handbook:


To view the learning goals, generic skills and graduate attributes for your degree, please locate the University Handbook entry for your degree at http://handbook.unimelb.edu.au/

Generic Skills

In this subject you will have the opportunity to develop important generic skills. These include: written communication, problem solving, statistical reasoning; application of theory to practice; synthesis of data and other information.

Prerequisites

- ACTL20002 Financial Mathematics II
- MAST20005 Statistics

Subject Contents

- Explain the concept of a survival model;
- Describe estimation procedures for future lifetimes;
- Define a Markov process, and apply Markov models in actuarial problems;
• Describe models of transfer between multiple states, including processes with single or multiple decrements, and derive relationships between probabilities of transfer and transition intensities;

• Derive maximum likelihood estimators for the transition intensities in models of transfers between states with piecewise constant transition intensities;

• Describe the binomial model of mortality, a maximum likelihood estimator for the probability of death and compare the binomial model with the multiple state models.

Academic Staff Contact Details

Lecturer Contact Details

Your coordinator is Professor David Dickson

Email: dcmd@unimelb.edu.au

Room: 324, Level 3, FBE Building, 111 Barry Street

Consultation hours will be notified via the LMS.

Email Protocol

Please note that we are only able to respond to student emails coming from a University email address. Please do not use personal email addresses such as Yahoo, Hotmail or even business email addresses. Emails from non-University email addresses may be filtered by the University’s spam filter, which means that we may not receive your email. All correspondence relating to this subject will only be sent to your University email address. Note that you must first activate your University email address before you can send or receive emails at that address. You can activate your email account at this link: http://accounts.unimelb.edu.au/.

While academic staff endeavor to address queries received via email, it is more appropriate to resolve substantive questions during lectures and tutorials and during normal consultation hours. With this in mind, we encourage students to attend all lectures and tutorials and to familiarize themselves with the consultation hours offered by the lecturers in this subject.
Lectures and Tutorials

Lecture Times

Tuesday, 2.15-3.15pm: Prest Theatre, FBE Building
Thursday, 10:00-11:00am: Turner Theatre, Biosciences
Friday, 3.15-4.15pm: Prest Theatre, FBE Building

Note that there will be at most 3 Friday classes, and most likely none.

Lecture Participation Requirements

Lecture attendance is very important and good class behaviour is expected. Mobile phones should be switched OFF (not silent, but OFF).

Lecture Slides

Lecture slides will be available on the LMS. Some slides will be incomplete and students are expected to take notes in lectures.

Tutorials

Tutorials start in week 2 of semester. You will be expected to work collaboratively in tutorials and to present work at the whiteboard. The solutions (but not the questions) will be posted to LMS after each tutorial.

There will be weekly problem sheets on the LMS. These will not be discussed in class, but solutions will be posted with a two week time lag.
Assessment

Assessment Overview

The assessment comprises the following:

<table>
<thead>
<tr>
<th>Assessment Task</th>
<th>Individual or Group</th>
<th>Due</th>
<th>Weighting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Written Assignment</td>
<td>Group</td>
<td>Week 4</td>
<td>10%</td>
</tr>
<tr>
<td>Written Assignment</td>
<td>Group</td>
<td>Week 10</td>
<td>10%</td>
</tr>
<tr>
<td>End-of-semester exam</td>
<td>Individual</td>
<td>Assessment period</td>
<td>80%</td>
</tr>
</tbody>
</table>

You will be assigned into groups. You are expected to work collaboratively within your group, including peer review of the group’s submission.

A specimen final exam paper with solutions will be posted on the LMS towards the end of semester.

Exam Policy

The Faculty requires that you are available for the entire examination period. Supplementary exams will not be provided in cases of absence during the examination period, unless the absence is due to serious illness or other serious circumstances.

The examination period for this semester is 9-26 June.

Special Consideration

- Students apply for Special Consideration through My Unimelb via the Apply for Special Consideration link under Exams and Assessment in the Admin tab.

- You must submit your online application no later than 3 working days after the due date for submission or examination of the particular component of assessment, to which your application refers.

Other Subject Resources

Past Exams

No past end-of-semester exams will be provided, but some problem sheets will contain past end-of-semester exam questions.
Other Information

- To login in to LMS, go to the web site here: http://www.lms.unimelb.edu.au/. Click on the Access the LMS button located on the right-hand side of the screen. Type in your unimelb email account username and password into the spaces provided. If you have not accessed your university email account before, note that you must activate your email account before you can log into the LMS (or access your email for that matter). Click Login.

- You are expected to complete problem sheets on a weekly basis.

- You must adhere to the Centre’s calculator policy for exams (which is the same as that for professional actuarial exams). Specifically, you may use only one of the following calculators:
  - Casio FX82 (with or without any suffix)
  - Casio FX83 (with or without any suffix)
  - Casio FX85 (with or without any suffix)
  - Sharp EL531 (with or without any suffix)
  - Texas Instruments BA II Plus (with or without any suffix)
  - Texas Instruments TI-30 (with or without any suffix)