ACTL30001
Actuarial Modelling I

SUBJECT GUIDE

Semester 1, 2014

Prepared by
Dr. Shuanming Li

Department of Economics
Faculty of Economics and Commerce
Subject Outline

Objectives

This subject is at the heart of actuarial practice; this semester’s material is essential background for ACTL30003 Contingencies and also for more advanced actuarial exams about life insurance and superannuation..

On successful completion of this subject students should be able to:

- explain the concept of survival model;
- describe estimation procedures for lifetime distributions;
- define a continuous-time Markov chain, 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, derive a maximum likelihood estimator for the probability of death and compare the binomial model with the multiple state models;
- study the first and second order ordinary differential equations and their applications in actuarial science
- define Poisson process, its properties and its applications

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/

Lecturer Contact Details

Your lecturers for ACTL 30001 is Dr. Shuanming Li

Email: shli@unimelb.edu.au

Room: 319, FBE Building

Phone: 83445616

Consultation Hours: Wednesday and Thursday 2:30-3:30pm
Lectures and Tutorials

This subject has two lecture hours and one tutorial hour per week. There are four additional lectures on Friday of Weeks 1, 4, 7, 10. There is a tutorial in Week 1 in which Questions 1-5 on the sheet of Tutorial 0 will be done, the rest questions are for practice purpose. All the material (exercises and solutions in particular) will be available on the University's Learning Management System (LMS), go to http://www.lms.unimelb.edu.au/

Lecture Times

**Tuesday, 14:15-15:15, Medical-Frederic Wood Jones Theatre**

**Thursday, 12:00-13:00, McCoy-Fritz Loewe Theatre**

**Friday, 14:15-15:15 (Weeks 1, 4, 7, 10), 200 Berkeley St-219 (Level 2 Theatre).**

Lecture Participation Requirements

Lecture attendance is very important and good class behaviours are appreciated.

Lecture Slides

Lecture slides can be found from the student workbook.

Tutorials

Attend at only one of 8 sessions each week. In order to keep up to date with your work, it is recommended that you attempt to complete tutorial questions on a weekly basis ahead of the tutorial class. Tutorial questions can be found in Workbook and tutorial solutions will be made available one week after the last tutorial.

Assessment

The subject will be assessed by a two-hour end of semester examination worth 80%, and two assignments worth 10% each. The timetable for assignments will be given at beginning of semester and put up on the LMS.

Note that, for the exam, only one non-programmable calculator will be allowed; dictionaries and other personal materials will not be allowed.
Past Exams and Specimen Exam

No past exams will be provided, but a specimen exam paper with solutions will be provided at LMS.

Exemption

Students who perform at a suitably high level in the end of semester exams in this subject and in ACTL30002 Actuarial Modeling II will be recommended for exemption from the professional subject CT4.

Reading Materials

- Actuarial Mathematics, Chapter 3, Bowers et al. Society of Actuaries.
- Actuarial Mathematics for Life Contingent Risks, Chapters 2, 3, 8, by David C. M. Dickson, Mary R. Hardy, Howard R. Waters

Comments on Exercises

Exercises do not necessarily follow the lectures exactly; this is natural and necessary from an educational point of view. For instance, an exercise may be useful preparation for a topic that will come later. At the end of semester, you will see that absolutely all the exercises were about the topics covered. All exercises are exam material.

Software

Students will be expected to use Excel, which is available in the undergraduate computer lab.
Other resources

The website of the Institute of Actuaries and the Faculty of Actuaries (UK) contains past exam papers and solutions for their Subjects 104 and CT4 (104 was the predecessor of CT4 and dealt with almost the same topics). Go to

http://www.actuaries.org.uk/students/exams/preparing/exam_papers

(Click on a particular year; the solutions are in the “Examiners' reports”.) It is recommended that you use this resource. Not all questions in those exams relate to this subject, but you will easily be able to find out which ones are relevant.

LMS Discussion Board

The Discussion Board for this subject can be accessed via the LMS subject page and allows you to post messages and read messages at any time. All students are free to communicate with each other using the Discussion Board by posting, reading, and replying to messages.

The discussion forum is organised into threads (conversations within a topic). Messages are posted by starting a new thread or replying to an existing posting. To access the Discussion Board, click on the Discussion Board located in the navigation menu of the LMS page for this subject.

Always be polite when asking questions or posting replies. Impolite language will not be tolerated. The lecturer reserves the right to ban students who use inappropriate/impolite language from using the Discussion Board.

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 familiarise themselves with the consultation hours offered by the lecturers in this subject.
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. See the Special Consideration web site for more information: http://www.ecom.unimelb.edu.au/students/special/#missing

Special Consideration

Students who have been significantly affected by illness or other serious circumstances during the semester may be eligible to apply for Special Consideration.

The following website contains detailed information relating to who can apply for Special Consideration and the process for making an application:

http://www.ecom.unimelb.edu.au/students/special/

Teaching & Learning Unit

The Teaching and Learning Unit offers a wide range of support services to students. If you are having any difficulty in studying for this subject you could arrange a consultation with the Unit’s learning skills specialist. The learning skills specialist can review your current approaches to study and offer advice on how to adjust to the demands of tertiary study. If you are a student from a non-English speaking background there is an English as a Second Language specialist who is available to help with your written work. Both of these specialists are available for face-to-face consultations or electronically through email. Go to the Faculty office to arrange for consultations or contact the specialists electronically through the Teaching and Learning Unit web page. The web page also contains a wide variety of study skills topics and information sheets for students, and a timetable of up-coming events, including focussed workshops, designed to support Economics and Commerce students in their study.

Please visit the TLU’s website – http://tlu.ecom.unimelb.edu.au/.