

MACQUARIE
UNIVERSITY



FACULTY OF
BUSINESS AND ECONOMICS

**ACST354/854
Survival Models**

Semester 1, 2009

Department of Actuarial Studies

**MACQUARIE UNIVERSITY
FACULTY OF BUSINESS AND ECONOMICS
UNIT OUTLINE**

Year and Semester: 2009 Semester 1

Unit convenor: Xian Zhou

Prerequisites: ACST243 or ACST255 (P); ACST211(P); STAT271(P)

Co-requisites: None

Students in this unit should read this unit outline carefully at the start of semester. It contains important information about the unit. If anything in it is unclear, please consult one of the teaching staff in the unit.

ABOUT THIS UNIT

Credit points: 4

The unit is divided into two parts, each will be taught by individual lecturer.

- 1. *Survival Models and Stochastic Processes* (weeks 1-9)
- 2. *Exposed-to-Risk and Graduation* (weeks 10-13)

The unit covers most of the materials in the UK Institute of Actuaries (IA) syllabus for Subject CT4. The exemption will be recommended if and only if a standardised numerical grade (SNG) of at least 65 is achieved.

A comprehensive understanding of the statistical concepts and methods contained in the pre-requisites is assumed. You should review these units as soon as possible if necessary.

TEACHING STAFF

Lecturer and Unit Coordinator: Dr. Xian Zhou, Room E4A 607, Ex 8566

If you wish to contact Xian Zhou, please do so by sending an email to xzhou@efs.mq.edu.au or via the Mail facility on the unit website.

Lecturer: Glenn Barnett, Room E4A 620

If you wish to contact Glenn Barnett, please do so by sending an email to gbarnett@efs.mq.edu.au

Tutor: Luke Nichols luke.nichols@students.mq.edu.au

If you have a question about the course content, please post it on the discussion board on the website. If you are uncertain about some topics, it is likely that other students are also confused. So it may be helpful to all of your fellow students if questions and answers are posted on the website.

Werner Fortmann is acting as a teaching assistant for this unit. Please address any enquiries about administration to Werner via the Private Mail facility on the unit website. If he can't answer your question he can pass the message on to the appropriate person.

CLASSES

Lectures are held on

Tuesdays from 11:00am to 1:00pm in E7B T4

Wednesdays from 9:00am to 11:00am in C5C T2

The lectures will NOT be recorded using i-lecture.

Tutorials are held on

Thursdays from 12:00pm to 1:00pm in E7B T3 for ACST354

Thursdays from 1:00pm to 2:00pm in W5C 311 for ACST854

Tutorials start in Week 2

Tutorial exercises will be available from the unit web site each week.

Tutorial exercises will not be assessed, but they form a very important part of the study and are closely related to the assessed components (assignments, class test and the final examination).

Tutorials are an opportunity for you to work on the week's tutorial questions and to obtain help with them as needed. The more preparation you do for the tutorial, the more you will benefit from the session.

Any alterations to the tutorial times, locations or enrolments will be advised in lectures and/or on the unit webpage.

REQUIRED AND RECOMMENDED TEXTS AND/OR MATERIALS

Lecture Notes will be posted on the website before the lectures.

The main reading materials (in addition to Lecture Notes) are the ActEd CT4 notes (2009 edition).

A preliminary reading of the ActEd notes before each lecture will considerably enhance the benefits you can gain from the lectures.

The ActEd CT5 notes can be purchased through ASSOC. More information about ASSOC can be found at its website <http://www.mqassoc.org>

UNIT WEB PAGE

The web page for this unit can be found at: <http://learn.mq.edu.au>

The website will be used extensively for this unit so please consult the web page frequently. You will find administrative updates, lecture notes, tutorials and assignments posted there. Materials posted on the website may be updated from time to time.

It is your responsibility to check the website regularly to make sure that you are up-to-date with the information for the unit.

LEARNING OBJECTIVES AND OUTCOMES

The discipline-based learning objectives and outcomes are as defined in the syllabus for Institute of Actuaries (IA) subject CT4.

In addition to the discipline-based learning objectives, all academic programs at Macquarie seek to develop students' generic skills in a range of areas. In this unit we aim to develop problem solving skills, communication skills, and critical analysis skills.

TEACHING AND LEARNING STRATEGY

- This unit is taught through 4 hours of lectures and 1 hour of tutorial per week. Lectures will cover the topics and materials in accordance with the syllabus for Institute of Actuaries (IA) Subject CT4. Tutorials will discuss exercise questions covered by the lectures.
- Students are expected to listen carefully to all lectures and tutorials; participate in discussions during tutorials, read relevant materials in advance; review the knowledge learnt in classes; and complete all assignments independently.
- A planned week-by-week list of the topics is as follows:

Week	Topics covered
1	Principle of actuarial modelling; Probability models (X Zhou)
2	Law of mortality; Survival analysis (X Zhou)
3	Estimation of survival distributions (X Zhou)
4	Cox proportional hazards models (X Zhou)
5	Binomial and Poisson models (X Zhou)
6	Stochastic processes; Markov chains (X Zhou)
7	Markov chains (X Zhou)
BREAK	
8	Markov jump processes (X Zhou); Class Test
9	Applications of Markov processes (X Zhou)
10	Exposed-to-risk and graduation (G Barnett)
11	Exposed-to-risk and graduation (G Barnett)
12	Exposed-to-risk and graduation (G Barnett)
13	Exposed-to-risk and graduation (G Barnett)

This is only a tentative schedule, and may be revised from time to time as the semester proceeds. Alterations will be advised in lectures and/or via the website.

RELATIONSHIP BETWEEN ASSESSMENT AND LEARNING OUTCOMES

Assessment tasks are set in accordance with the requirements of Institute of Actuaries for Subject CT4.

Assessment tasks consist of:

- Class Test 15%
- Assignments 15%
- Final Examination 70%

All students are required to pass the final examination AND have satisfactory performance on the class test in order to obtain a passing grade for the unit.

Assignments:

Three assignments are planned, with each counting for 5% of the assessment.

Solutions to the assignments will be posted on the website after they are collected.

Class Test:

There will be one class test scheduled for Wednesday 28 April 2009 during the usual lecture time. It will cover lectures up to and including 6 April 2009.

If there are any changes in test time and/or teaching plans, the announcements of the changes will be posted on the unit website.

During class test, students will be allowed to use

- a calculator (one without text retrieval capability); and
- one A4 page into the exam (the A4 page may have writing or typing on both sides).

Final Examination:

Exam duration: 3 hour exam plus 10 minutes reading time.

Normal examination rules apply to the conduct of the class tests and the final exam. These rules are set out under the heading “Conduct of Examinations” in the Student Information section of the Macquarie University Handbook of Undergraduate Studies (page 43).

The University Examination period in First Half Year 2009 is from 10 June to 26 June.

You are expected to present yourself for examination at the time and place designated in the University Examination Timetable. The timetable will be available in Draft form approximately eight weeks before the commencement of the examinations and in Final form approximately four weeks before the commencement of the examinations.

<http://www.timetables.mq.edu.au/exam>

The only exception to not sitting an examination at the designated time is because of documented illness or unavoidable disruption. In these circumstances you may wish to consider applying for Special Consideration. Information about unavoidable disruption and the special consideration process is available at

<http://www.reg.mq.edu.au/Forms/APSCon.pdf>

If a Supplementary Examination is granted as a result of the Special Consideration process the examination will be scheduled after the conclusion of the official examination period. (Individual Faculties may wish to signal when the Faculties' Supplementary Exams are normally scheduled.)

You are advised that it is Macquarie University policy not to set early examinations for individuals or groups of students. All students are expected to ensure that they are available until the end of the teaching semester, that is the final day of the official examination period.

PLAGIARISM

The University defines plagiarism in its rules: "Plagiarism involves using the work of another person and presenting it as one's own." Plagiarism is a serious breach of the University's rules and carries significant penalties. You must read the University's practices and procedures on plagiarism. These can be found in the *Handbook of Undergraduate Studies* or on the web at: <http://www.student.mq.edu.au/plagiarism/>

The policies and procedures explain what plagiarism is, how to avoid it, the procedures that will be taken in cases of suspected plagiarism, and the penalties if you are found guilty. Penalties may include a deduction of marks, failure in the unit, and/or referral to the University Discipline Committee.

STUDENT SUPPORT SERVICES

Macquarie University provides a range of Academic Student Support Services. Details of these services can be accessed at <http://www.student.mq.edu.au>.

Besides the general services available (see below), the Faculty of Business and Economics offers BESS: Business and Economics Student Services
http://www.efs.mq.edu.au/student_support/BESS