ABOUT THIS UNIT

Students will use survival models to estimate decrement rates from actual experience, compare these with the rates in standard tables, and prepare new standard tables. As part of the construction of new tables, consideration will be given to risk factors and the effects of selection; design of data collection; statistical analysis and graduation of the observed rates; and testing of the graduation. The unit concludes with a review of the principles of actuarial modelling and an introduction to the "actuarial control cycle", a conceptual framework of the processes for developing and managing financial enterprises and products.

TEACHING STAFF

Professor Piet de Jong is the unit convenor. Lectures will be taken by Piet de Jong, Glen Barnett and Bruce Edwards.

Celeste Chai is the teaching administrator for this unit. Administrative questions that are not covered in this unit outline should be directed to her via the private Mail facility of the website. If the questions are of interest to everyone, the question and the reply will be posted to the website, so you should specifically request if you want your message to remain private.

Questions about unit content should be sent to the Discussion Board of the website or raised during tutorials or lectures.

CONSULTATION TIMES

In general, questions about the unit content should be sent to the Discussion Board, so that everyone gets to see the question and answer. However, Piet de Jong will be available for consultation on his topics at Monday 2pm to 5pm during teaching weeks 3 to 8.

Students experiencing significant difficulties with any topic in the unit are encouraged to seek assistance immediately.

CLASSES
The timetable for classes can be found on the University web site at www.timetables.mq.edu.au.

**Lectures.** The unit material is covered in the three hours of lectures each week.
- Monday 9:00-10:00 in E7B T4 Theatre
- Friday 13:00-15:00 in W5A T2 Theatre

**Tutorials.** The tutorial will cover material from the previous week’s lectures. Please attend the tutorial you are enrolled in. The tutorial is an opportunity for you to attempt the exercises given for each section of work, and to discuss problems with the tutor. A two hour tutorial is scheduled as per the timetable. **There are no tutorials in the first week of classes**

**CLASS ETIQUETTE**

Keep mobile phones switched off during all lectures and tutorials. If there is a reason for you to keep your phone on, request to be allowed to do so before the start of the class. Lectures commence 5 minutes past the hour and you are expected to be punctual. Keep conversations to a minimum during classes so as not to disrupt your fellow students (and the lecturer!).

**REQUIRED AND RECOMMENDED TEXTS AND/OR MATERIALS**

**Required texts**

There are no required texts.

Lecture notes and/or copies of lecture overheads and/or solutions to lecture exercises will be available for downloading from the ACST359/819 iLearn website. The nature of the material provided differs from topic to topic, depending on the teacher and the nature of the material taught. For most sections, there will be material on the web site which you will need to print in advance and bring to class. Other material such as solutions to exercises, is made available after the relevant class.

**Optional recommended text**

The ActEd CT4 notes are not required to be purchased. However, if you have already purchased these notes for ACST358/818, you may find them useful as an additional source.

**TECHNOLOGY USED AND REQUIRED**

- Notes are provided in pdf format.
- Some data will be provided to students in the older Excel format denoted by the .xls extension. This can be read by most spreadsheet packages. The student labs provide access to Excel.
- For the class presentations, students may wish to use Powerpoint, available in the Student Labs.
- Students will require a calculator for the final examination and the in-class test. Calculators which are programmable or which can store text are not allowed.
UNIT WEB PAGE

To access the website, go to http://ilearn.mq.edu.au.

If you have any trouble logging in (e.g. you have forgotten your password), please contact the Student IT Helpdesk.

When you login you will have access to the websites for all the units in which you are enrolled.

Remember to logout and close your browser when you have finished using the site. If you don’t, another person can use the still running browser to access the website with your account.

The website will be used as an integral part of this unit. It is used to distribute lecture and tutorial material and information about assessment tasks.

Discussions. Use the website’s Discussion facility, along with the tutorial time, as your resource for asking questions about the content of the unit. Please address your questions to your fellow students – if there is no response or an incorrect response from the class the teaching staff will post a response. You are encouraged to post answers to other students’ questions – this is one of the most effective ways to clarify your own understanding of the material. You should consult the Discussions frequently, to contribute to questions and see answers to queries.

LEARNING OUTCOMES

On completion of this unit you should be able to do the following.

1. Describe the principles of actuarial modelling.
2. Describe the Binomial and Poisson models of mortality, and derive maximum likelihood estimates where appropriate.
3. Develop and apply methods for estimating transition intensities depending on age, exactly or using the census approximation.
4. Test, using statistical methods, crude estimates for consistency with a standard table or set of graduated estimates, and interpret the results of the tests.
5. Apply, describe and analyse statistical methods of graduation of crude estimates.
6. Discuss the concept of the Actuarial Control Cycle, and apply it to a variety of straightforward practical commercial situations.
7. Articulate and discuss the developed actuarial techniques in a way accessible to non actuaries.

GRADUATE CAPABILITIES

In addition to the discipline-based learning objectives, all academic programs at Macquarie seek to develop the capabilities the University's graduates will need to develop to address
the challenges, and to be effective, engaged participants in their world. This unit contributes to this by developing the following discipline specific knowledge and graduate capabilities:

1. Discipline Specific Knowledge and Skills:
   (a) Have skills in fitting and assessing the reliability of statistical models, particularly in the context of financial applications.
   (b) Have the ability to develop methods for measuring and manipulating the range of decrement rates relevant to actuarial problems.

2. Critical, Analytical and Integrative Thinking
3. Problem Solving and Research Capability
4. Effective Communication
5. Creative and Innovative
6. Capable of professional and personal and judgement and initiative

TEACHING AND LEARNING STRATEGY

- The unit is taught using three hours of lecture class times and two hours of tutorials each week.
- In many weeks, the lecture time will not be run in the traditional lecture format, but will involve class participation and group discussion. You are expected to actively participate in these classes and in tutorials.

RELATIONSHIP BETWEEN ASSESSMENT AND LEARNING OUTCOMES

This unit is assessed using a class test, an assignment, a presentation, and a final examination. An assessment schedule is given in the following pages and any changes to the assessment or assessment due dates will be advised in classes.

In addition to tasks that count for assessment, you will be provided with exercises to attempt during the tutorials and/or in your own time. Exercises are aimed at helping you to understand the fundamental concepts before moving on to further material. Exercises are not necessarily indicative of the difficulty of questions you could expect in the class test or on the final exam (i.e. they are mostly easier, to assist initial learning).
<table>
<thead>
<tr>
<th>Assignment</th>
<th>Test</th>
<th>Presentation</th>
<th>Participation</th>
<th>Exam</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>Numerical calculations</td>
<td>In-class test covering sections 1 to 6</td>
<td>Presentation on a paper recently presented to the Australian actuarial profession</td>
<td>Participate in online discussion via questions or answers</td>
</tr>
<tr>
<td>Due date</td>
<td>24 August 23:59h</td>
<td>5 Oct</td>
<td>Weeks beginning 22 Oct and 29 Oct</td>
<td>Ongoing</td>
</tr>
<tr>
<td>% Weighting</td>
<td>8%</td>
<td>10%</td>
<td>10%</td>
<td>2%</td>
</tr>
<tr>
<td>Grading method</td>
<td>Correct numerical answers</td>
<td>Marked against a marking template.</td>
<td>Marked according to criteria given in the presentation task.</td>
<td>0 – No participation 1 – participates 2 – active, constructive participation</td>
</tr>
<tr>
<td>Submission method</td>
<td>Email to <a href="mailto:acst359@gmail.com">acst359@gmail.com</a> In prescribed format</td>
<td>Handed in at conclusion of test</td>
<td>N/A</td>
<td>Online comments and in class discussion</td>
</tr>
<tr>
<td>Feedback</td>
<td>Complete layout of correct calculations</td>
<td>Marked papers returned to students. Solutions will highlight common problems.</td>
<td>Feedback provided via iLearn</td>
<td>-</td>
</tr>
<tr>
<td>Estimated student workload (hours)</td>
<td>8</td>
<td>20</td>
<td>15</td>
<td>0</td>
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<tr>
<td>Learning outcomes assessed</td>
<td>2-4</td>
<td>2 - 5</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Graduate capabilities assessed</td>
<td>1-3</td>
<td>1 - 2</td>
<td>2 - 6</td>
<td>2 - 6</td>
</tr>
<tr>
<td>Week</td>
<td>Week Beginning</td>
<td>Lecturer</td>
<td>Monday 9h-10h class</td>
<td>Friday 13h-15h class</td>
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</tr>
<tr>
<td>1</td>
<td>30 Jul</td>
<td>PdJ</td>
<td>Binomial Model</td>
<td>Poisson Model</td>
</tr>
<tr>
<td>2</td>
<td>6 Aug</td>
<td>PdJ</td>
<td>Exposed to Risk I</td>
<td>Exposed to Risk I</td>
</tr>
<tr>
<td>3</td>
<td>13 Aug</td>
<td>PdJ</td>
<td>Exposed to Risk II</td>
<td>Test of Model</td>
</tr>
<tr>
<td>4</td>
<td>20 Aug</td>
<td>GB</td>
<td>Graduation</td>
<td>Graduation</td>
</tr>
<tr>
<td>5</td>
<td>27 Aug</td>
<td>GB</td>
<td>Graduation</td>
<td>Graduation/Testing</td>
</tr>
<tr>
<td>6</td>
<td>3 Sept</td>
<td>GB</td>
<td>Testing a Graduation</td>
<td>Actuarial Modelling</td>
</tr>
<tr>
<td>7</td>
<td>10 Sept</td>
<td>GB/PdJ</td>
<td>Actuarial Modelling</td>
<td>Intro to Research</td>
</tr>
<tr>
<td>STUDY BREAK</td>
<td>17 Sept - 24 Sept</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>1 Oct</td>
<td>PdJ</td>
<td>Labour Day – No class</td>
<td>Test</td>
</tr>
<tr>
<td>9</td>
<td>8 Oct</td>
<td>BE</td>
<td>Control Cycle - Intro</td>
<td>Lecture: Section 8 (cont)</td>
</tr>
<tr>
<td>10</td>
<td>15 Oct</td>
<td>BE</td>
<td>Lecture: Section 8 (cont)</td>
<td>Lecture: Section 8 (cont)</td>
</tr>
<tr>
<td>11</td>
<td>22 Oct</td>
<td>BE/BH</td>
<td>Lecture: Section 8 (cont)</td>
<td>Introduction to Presenting II</td>
</tr>
<tr>
<td>12</td>
<td>29 Oct</td>
<td>BE</td>
<td>Class presentations</td>
<td>Class presentations</td>
</tr>
<tr>
<td>13</td>
<td>5 Nov</td>
<td>Tba/PdJ</td>
<td>Class presentations</td>
<td>Class presentations</td>
</tr>
</tbody>
</table>

- Binomial Model
- Exposed to Risk I
- Exposed to Risk II
- Test of Model
- Graduation
- Graduation/Testing
- Testing a Graduation
- Actuarial Modelling
- Intro to Research
Early Diagnostic Task

A non-assessable quiz will be distributed via the web site. Solutions will be discussed in the Week 5 tutorial.

Assignment

The assignment contributes 8% of the assessment weight. Assignments must be submitted as indicated in the above table. This is a group assignment: individual contributions are not individually assessed. In accordance with university policy, it is assessed on a pass/fail basis. Late submissions are only be accepted if every single member of the group is able to submit a valid special consideration request. (That is, don’t rely on a single member of your group to accomplish the submission. For example, the excuse that the member of your group who was supposed to submit the assignment was delayed by sickness or traffic is not accepted. You need a back-up plan to deal with this possibility.)

Class test

The class test will occur in the class on 4 October. It contributes 10% to the total assessment. It covers Sections 1 to 6.

An announcement will be made on the web site when assignments are ready for collection from BESS. If the marking is completed at a suitable time, we may return them at tutorials, with uncollected tests then being placed at BESS.

Presentation

The presentation contributes 8% of the assessment weight. While you will work in a group to develop your presentation, you will be marked on your individual performance.

Participation

Participation in online and in class discussion will contribute 2% of the assessment weight. Zero marks are awarded for no participation. Active, constructive participation, outlining searching problems and/or solutions, are awarded 2 marks. Anything else is awarded 1 mark.

Exam

The final examination is worth 70% of the final assessment. It will be a two-hour written paper with ten minutes reading time held during the University Examination period.

The University Examination period in Second Half Year 2012 is as scheduled. 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 from http://www.exams.mq.edu.au/.

Macquarie University policy excludes early examinations outside the designated time slot as per the exam timetable. 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.
RULES REGARDING TESTS AND EXAMINATIONS

Normal examination rules apply to the conduct of the class test and the final examination. These rules are available at http://www.exams.mq.edu.au/. Students are responsible for familiarising themselves with these rules prior to the class test and final examination.

Calculators will be allowed in the class test and the final examination but a clear indication of the steps involved in every calculation must be shown. Calculators that are programmable, or which have a text-retrieval capacity, whether or not they have a full alphabet on the keyboard, are not allowed. Calculators may be checked at the commencement of the class test and final exam, and the make/model may be recorded.

Dictionaries will not be permitted in the class tests or the final examination.

Academic Senate has resolved that mobile phones should not be used in classrooms or be brought into examination rooms. Communication devices, including but not restricted to mobile phones, text message receivers, pagers and wireless-equipped calculators, may not be brought into the class test or exam. If a student is found to have brought such a device into the examination room, the argument that the device was turned off will NOT be regarded as an acceptable excuse.

ACADEMIC HONESTY

The nature of scholarly endeavour, dependent as it is on the work of others, binds all members of the University community to abide by the principles of academic honesty. Its fundamental principle is that all staff and students act with integrity in the creation, development, application and use of ideas and information. This means that:

- all academic work claimed as original is the work of the author making the claim
- all academic collaborations are acknowledged
- academic work is not falsified in any way
- when the ideas of others are used, these ideas are acknowledged appropriately.

Further information on the academic honesty can be found in the Macquarie University Academic Honesty Policy at http://www.mq.edu.au/policy/docs/academic_honesty/policy.html

GRADES

Macquarie University uses the following grades in coursework units of study:

HD - High Distinction
D - Distinction
CR - Credit
P - Pass
F - Fail

Grade descriptors and other information concerning grading are contained in the Macquarie University Grading Policy which is available at: http://www.mq.edu.au/policy/docs/grading/policy.html

GRADING APPEALS AND FINAL EXAMINATION SCRIPT VIEWING

If, at the conclusion of the unit, you wish to lodge an appeal of grade and/or view your final exam script, please refer to the following website providing information about these processes and relevant cut off dates. Please read the instructions concerning valid grounds for appeal before lodging an appeal.

http://www.businessandeconomics.mq.edu.au/new_and_current_students/undergraduate_current_students/how_do_i/grade_appeals

SPECIAL CONSIDERATION

The University is committed to equity and fairness in all aspects of its learning and teaching. In stating this commitment, the University recognises that there may be circumstances where a student is prevented by unavoidable disruption from performing in accordance with their ability. A special consideration policy exists to support students who experience serious and unavoidable disruption such that they do not reach their usual demonstrated performance level. The policy is available at: http://www.mq.edu.au/policy/docs/special_consideration/policy.html

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.

IT CONDITIONS OF USE

Access to all student computing facilities within the Faculty of Business and Economics is restricted to authorised coursework for approved units. Student ID cards must be displayed in the locations provided at all times.

Students are expected to act responsibly when utilising University IT facilities. The following regulations apply to the use of computing facilities and online services:
● Accessing inappropriate web sites or downloading inappropriate material is not permitted. Material that is not related to coursework for approved unit is deemed inappropriate.
● Downloading copyright material without permission from the copyright owner is illegal, and strictly prohibited. Students detected undertaking such activities will face disciplinary action, which may result in criminal proceedings.
Non-compliance with these conditions may result in disciplinary action without further notice.

Students must use their Macquarie University email addresses to communicate with staff as it is University policy that the University issued email account is used for official University communication.

**RESEARCH AND PRACTICE**

This unit uses research from recent papers presented to the Australian actuarial profession. Students are required to read, digest, and make a presentation such a paper.