Year and Semester: 2012 Session 2

Unit convenor: Dr. Xian Zhou

Prerequisites: None

Co-requisites: STAT810 and ACST851

Credit points: 4

This unit is co-taught with unit ACST255 Contingent Payments 1.

Students in this unit should read this unit guide 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

- **Unit description:** This unit covers the analysis of cash flows dependent on uncertain events. Single decrement survival models will be used to analyse the present value of payments under life insurance and annuity contracts. The concepts of pricing and reserving for future contingent liabilities are considered. A comprehensive understanding of the compound interest and statistical concepts contained in the pre-requisites is assumed. You should review these units as soon as possible if necessary.

- **Unit rationale:** This unit is a core unit of the degree program for actuarial studies. It covers a part the professional subject CT5. It is a prerequisite to units ACST860 Contingent Payments 2 and ACST818 Survival Models.

TEACHING STAFF

- Convenor: Dr. Xian Zhou, Room E4A 607, Ex 8566, xian.zhou@mq.edu.au
- Tutor: Xian Zhou xian.zhou@mq.edu.au
- Teaching Assistant: Danny Bechara danny.bechara@students.mq.edu.au

CONTACTING STAFF

- Consultation times:
  Xian Zhou: Thursdays 1-3pm during teaching weeks, in room E4A 607

You are encouraged to seek help at a time that is convenient to you from a staff member teaching on this unit during their regular consultation hours. In special circumstances, an
appointment may be made outside regular consultation hours. Staff will not conduct consultations by email. You may, however, phone staff during their consultation hours.

In order to gain access to staff located at levels 1, 2 and 3 of building E4A during their consultation hours please ring the staff member from the phones available in the lobby (phone numbers of relevant staff members will be provided on Blackboard and are available next to the phones).

- **Other ways of contacting staff:**
  - Xian Zhou: Email to xian.zhou@mq.edu.au or via the unit website.

The most effective/preferred way for students to contact staff is via email.

Students experiencing significant difficulties with any topic in the unit must seek assistance immediately.

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### CLASSES

- **Number and length of classes:**
  - 5 hours face-to-face teaching per week consisting of 1x2 hour plus 1x1 hour lecture and 1x2 hour tutorial

- The timetable for classes can be found on the University web site at: [http://www.timetables.mq.edu.au/](http://www.timetables.mq.edu.au/)

- Any alterations to classes will be advised in lectures and/or on the unit webpage.

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### PRIZES

Not applicable

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### REQUIRED AND RECOMMENDED TEXTS AND/OR MATERIALS

- The primary texts for the unit are the Lecture Notes provided by the Lecturer.

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

- The main additional reading materials are the ActEd CT5 notes (2012 edition).


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### TECHNOLOGY USED AND REQUIRED

- The internet will be extensively used to provide course information, deliver teaching materials, answer and discuss questions, and make announcements related to this unit.

- You will need access to the internet to obtain course information and download teaching materials.
UNIT WEB PAGE

- Course material is available on the learning management system (iLearn)
- The web page for this unit can be found at: http://ilearn.mq.edu.au
- 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 OUTCOMES

The learning outcomes of this unit are:

1. Understand simple survival models
2. Master the skills to calculate the expected present values and the variances of benefits in standard life assurance and annuity contracts
3. Understand the concepts and applications of select and ultimate mortalities in life insurance
4. Understand and be familiar with the calculations of net premiums and reserves under various life insurance contracts
5. Understand and be able to calculate prospective and retrospective policy values under variable benefits and with-profit life insurance policies
6. Understand the costs and profits of life insurance business and be able to calculate gross premiums and reserves

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 graduate capabilities:

1. Discipline Specific Knowledge and Skills:
   (a) Have an appreciation of the time value of money.
   (b) Be an expert in compound interest theory, in both discrete and continuous scenarios.
   (c) Have a deep intuitive understanding of the meaning of probability and the methods of manipulating probabilities.
   (d) Understand the use of Expected Present Value as a key concept in many actuarial applications.
2. Critical, Analytical and Integrative Thinking
3. Problem Solving
4. Effective Communication
5. Capable of Professional and Personal Judgement and Initiative
6. Commitment to Continuous Learning
LEARNING AND TEACHING ACTIVITIES

- The unit is taught through 3 hours of lectures and 1 hour of tutorial per week. Lectures will cover the topics and materials in accordance with the syllabus of Subject CT5 of Institute of Actuaries (IA). 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 assessment and practice tasks independently.

- A planned week-by-week list of the topics is as follows:

<table>
<thead>
<tr>
<th>Week</th>
<th>Topics covered</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Review of probability; Expected Present Value; Introduction to Survival Models</td>
</tr>
<tr>
<td>2</td>
<td>Life Assurance Contracts</td>
</tr>
<tr>
<td>3</td>
<td>Life Annuity Contracts</td>
</tr>
<tr>
<td>4</td>
<td>The Life Table; Select Mortality</td>
</tr>
<tr>
<td>5</td>
<td>Evaluation of Life Insurance Contracts</td>
</tr>
<tr>
<td>6</td>
<td>Net Premiums and Reserves</td>
</tr>
<tr>
<td>7</td>
<td>Net Premium Reserve and Policy Value</td>
</tr>
<tr>
<td></td>
<td>BREAK</td>
</tr>
<tr>
<td>8</td>
<td>Policies with Variable Benefits</td>
</tr>
<tr>
<td>9</td>
<td>With-profit policies</td>
</tr>
<tr>
<td>10</td>
<td>Expenses of Life Insurance; Gross premiums</td>
</tr>
<tr>
<td>11</td>
<td>Gross premiums and Reserves</td>
</tr>
<tr>
<td>12</td>
<td>Profit and Loss in Life Insurance</td>
</tr>
<tr>
<td>13</td>
<td>Revision</td>
</tr>
</tbody>
</table>

Note: This is only a tentative schedule and subject to variations as the class progresses.

RESEARCH AND PRACTICE

- This unit gives you practice in applying research findings in your assignments
## Relationship Between Assessment and Learning Outcomes

<table>
<thead>
<tr>
<th>Title/Name</th>
<th>Assessment Task 1</th>
<th>Assessment Task 2</th>
<th>Assessment Task 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quiz</td>
<td>Test (take-home)</td>
<td>Final Examination*</td>
<td></td>
</tr>
<tr>
<td>Description</td>
<td>12 multiple choice questions</td>
<td>6 problem-solving questions requiring detailed answers; due in one day after being distributed</td>
<td>3 hours plus 10 minutes reading; including both multiple choice and problem-solving questions</td>
</tr>
<tr>
<td>Due date (tentative)</td>
<td>Friday 24/08/2012</td>
<td>Monday 22/10/2012</td>
<td>To be arranged by central time tabling</td>
</tr>
<tr>
<td>% Weighting</td>
<td>10%</td>
<td>20%</td>
<td>70%</td>
</tr>
<tr>
<td>Grading method</td>
<td>According to correctness of answers</td>
<td>Based on level of understanding and problem solving skills; full solutions are expected.</td>
<td>Based on level of understanding and problem solving skills; full solutions are expected for problem-solving questions</td>
</tr>
<tr>
<td>Submission method</td>
<td>Answer sheet</td>
<td>Answer sheets</td>
<td>Answer book</td>
</tr>
<tr>
<td>Feedback (type, method, date)</td>
<td>Through marked scripts (within one week after the due date), consultations and/or class discussions</td>
<td>Through marked scripts (within 3 weeks after the due date), consultations and/or class discussions</td>
<td>No feedback will be provided on the final examination in line with university policies</td>
</tr>
<tr>
<td>Estimated student workload (hours)</td>
<td>5 – 7 hours</td>
<td>12 – 18 hours</td>
<td>20 – 25 hours</td>
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<tr>
<td>Learning outcomes assessed (max 6)</td>
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<tr>
<td>6</td>
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<tr>
<td>Graduate capabilities assessed (max 4)</td>
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<tr>
<td>5</td>
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</tbody>
</table>

*Passing the Final Examination is required to pass this unit.*
• **Take-home test**: This test will have 100 marks in total. A minimum of 60 marks is required to be considered as satisfactory coursework for this unit.

• **Assignments**: There will be three Assignments for this unit. They will not be assessed, but should be completed independently. Solutions will be provided.

• **Extension**: No extensions will be granted. Students who have not submitted the task prior to the deadline will be awarded a mark of 0 for the task, except for cases in which an application for special consideration is made and approved.

• **Late submissions**: Late submissions of answers will not be accepted.

• **Attendance**: Attendance of lectures and tutorials is essential to the success of studying this unit, although it will not be recorded.

• **Examinations**: A final examination is included as an assessment task for this unit to provide assurance that:
  
  i) the product belongs to the student and
  
  ii) the student has attained the knowledge and skills tested in the exam

A 3 hour final examination for this unit will be held during the University Examination period.

Passing the final examination is required to pass this unit.

The University Examination period in Session 2 of 2012 is from 12 November to 30 November.

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://exams.mq.edu.au/](http://exams.mq.edu.au/)

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. The University’s policy on special consideration process is available at [http://www.mq.edu.au/policy/docs/special_consideration/policy.html](http://www.mq.edu.au/policy/docs/special_consideration/policy.html)

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.)

The Macquarie university examination policy details the principles and conduct of examinations at the University. The policy is available at: [http://www.mq.edu.au/policy/docs/examination/policy.htm](http://www.mq.edu.au/policy/docs/examination/policy.htm)
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 have performed below expectations, and are considering lodging an appeal of grade and/or viewing your final exam script please refer to the following website which provides information about these processes and the cut off dates in the first instance. Please read the instructions provided concerning what constitutes a valid grounds for appeal before appealing your grade.

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 Support Services. Details of these and other services for students can be accessed at http://www.student.mq.edu.au.

BESS: Business and Economics Student Services (BESS) is located in room E4B106. Information about facilities and services is at: http://businessandeconomics.mq.edu.au/for/new_and_current_students/undergraduate/bess
In this unit, answers to quizzes and class test will be returned via BESS.

Consultation room: Consultation sessions with tutors will be held in the FBE Consultation Room E4B 104 at the times outlined previously under Consultation Times.

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 using 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 units 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.