



# ACST859

## Contingent Payments 1

S1 Day 2016

*Dept of Applied Finance and Actuarial Studies*

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#### **Disclaimer**

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## General Information

Unit convenor and teaching staff Xian Zhou <a href="mailto:xian.zhou@mq.edu.au">xian.zhou@mq.edu.au</a>
Credit points 4
Prerequisites
Corequisites ACST851 and (STAT806 or STAT810 or (ACST601 and ACST604))
Co-badged status
Unit description This unit covers the analysis of cash flows dependent on uncertain events of mortality. Single decrement survival models will be used to evaluate the expected present values of payments under life insurance and annuity contracts, and calculate the premiums of such contracts. The concepts of pricing and reserving for future contingent liabilities are considered, and the methods of calculating required reserves will be discussed.

## Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at <https://www.mq.edu.au/study/calendar-of-dates>

## Learning Outcomes

On successful completion of this unit, you will be able to:

Understand simple survival models and related properties

Master the skills to calculate the expected present values and the variances of benefits in standard life assurance and annuity contracts

Understand the concepts of select and ultimate mortalities and their applications

Familiar with the calculations of net premiums and reserves under various life insurance contracts

Able to calculate prospective and retrospective policy values under variable benefits and withprofit life insurance policies

Understand the costs and profits of life insurance business and be able to calculate gross premiums and reserves

## General Assessment Information

### Extensions and penalties on coursework assessment tasks:

No extensions will be granted. There will be a deduction of 10% of the total available marks made from the total awarded mark for each 24 hour period or part thereof that the submission is late (for example, 25 hours late in submission – 20% penalty). This penalty does not apply for cases in which an application for disruption of studies is made and approved. No submission will be accepted after solutions have been posted.

### Submission of assessment tasks:

Answers to the quiz are to be submitted in paper form by 11am, Wednesday 30 March 2016.

Answers to the take-home test are to be submitted in paper form by 3pm, Wednesday 18 May 2016.

### Open-book final examination:

The final examination will be open book in the sense that students can bring in any materials written or printed on paper with any size and number of pages.

### Gradebook:

It is the responsibility of students to view their marks for each within session assessment on iLearn within 20 days of posting. If there are any discrepancies, students must contact the unit convenor immediately. Failure to do so will mean that queries received after the release of final results regarding assessment tasks (not including the final exam mark) will not be addressed.

### Supplementary exams:

Further information regarding supplementary exams, including dates, is available here

[http://www.businessandconomics.mq.edu.au/current\\_students/undergraduate/how\\_do\\_i/disruption\\_to\\_studies](http://www.businessandconomics.mq.edu.au/current_students/undergraduate/how_do_i/disruption_to_studies).

## Assessment Tasks

Name	Weighting	Due
Quiz	10%	30 March
Test	20%	18 May
Examination	70%	University Examination Period

## Quiz

Due: **30 March**

Weighting: **10%**

True/false and multiple-choice questions

On successful completion you will be able to:

- Understand simple survival models and related properties
- Understand the concepts of select and ultimate mortalities and their applications
- Understand the costs and profits of life insurance business and be able to calculate gross premiums and reserves

## Test

Due: **18 May**

Weighting: **20%**

Problem-solving questions

On successful completion you will be able to:

- Understand simple survival models and related properties
- Master the skills to calculate the expected present values and the variances of benefits in standard life assurance and annuity contracts
- Understand the concepts of select and ultimate mortalities and their applications
- Familiar with the calculations of net premiums and reserves under various life insurance contracts
- Able to calculate prospective and retrospective policy values under variable benefits and withprofit life insurance policies
- Understand the costs and profits of life insurance business and be able to calculate gross premiums and reserves

## Examination

Due: **University Examination Period**

Weighting: **70%**

Open-book examination with a combination of true/false, multiple-choice and problem-solving questions

On successful completion you will be able to:

- Master the skills to calculate the expected present values and the variances of benefits

in standard life assurance and annuity contracts

- Understand the concepts of select and ultimate mortalities and their applications
- Familiar with the calculations of net premiums and reserves under various life insurance contracts
- Able to calculate prospective and retrospective policy values under variable benefits and withprofit life insurance policies
- Understand the costs and profits of life insurance business and be able to calculate gross premiums and reserves

## **Delivery and Resources**

### **Classes**

This unit is taught through 3 hours of lectures and 2 hours of tutorials per week.

The timetable for classes can be found on the University web site at:

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

Tutorials start in Week 2.

### **Unit Web Page**

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

### **Technology Used and required**

You will need access to the internet to obtain course information and download teaching materials from the unit website.

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

### **Required and Recommended Texts and/or Materials**

Lecture Notes are the required materials and will be posted on the website before the lectures.

The main additional reading materials are the ActEd CT5 notes. This will also be used as background reading for ACST860 Contingent Payments 2.

### **What is required to complete the unit satisfactorily**

To be eligible to pass this unit, a pass is required in the final examination.

## Unit Schedule

Week 1: Review of probability; Expected present value; Introduction to survival models

Week 2: Life assurance contracts

Week 3: Life annuity contracts

Week 4: The Life table; Select mortality

Week 5: Evaluation of life insurance contracts

Week 6: Net premiums and reserves

Week 7: Prospective and retrospective policy values

Week 8: Policies with variable benefits

Week 9: With-profit policies

Week 10: Gross premiums

Week 11: Gross premiums and reserves; Profit and loss in life insurance

Week 12: Profit and loss in life insurance

Week 13: Revision

**Note:** This is only a tentative schedule. Small departures are expected on the basis of week to week progress.

## Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central](#). Students should be aware of the following policies in particular with regard to Learning and Teaching:

Academic Honesty Policy [http://mq.edu.au/policy/docs/academic\\_honesty/policy.html](http://mq.edu.au/policy/docs/academic_honesty/policy.html)

**New Assessment Policy in effect from Session 2 2016** [http://mq.edu.au/policy/docs/assessment/policy\\_2016.html](http://mq.edu.au/policy/docs/assessment/policy_2016.html). For more information visit [http://students.mq.edu.au/events/2016/07/19/new\\_assessment\\_policy\\_in\\_place\\_from\\_session\\_2/](http://students.mq.edu.au/events/2016/07/19/new_assessment_policy_in_place_from_session_2/)

Assessment Policy prior to Session 2 2016 <http://mq.edu.au/policy/docs/assessment/policy.html>

Grading Policy prior to Session 2 2016 <http://mq.edu.au/policy/docs/grading/policy.html>

Grade Appeal Policy <http://mq.edu.au/policy/docs/gradeappeal/policy.html>

Complaint Management Procedure for Students and Members of the Public [http://www.mq.edu.au/policy/docs/complaint\\_management/procedure.html](http://www.mq.edu.au/policy/docs/complaint_management/procedure.html)

Disruption to Studies Policy [http://www.mq.edu.au/policy/docs/disruption\\_studies/policy.html](http://www.mq.edu.au/policy/docs/disruption_studies/policy.html) *The Disruption to Studies Policy is effective from March 3 2014 and replaces the Special Consideration Policy.*

In addition, a number of other policies can be found in the [Learning and Teaching Category](#) of

Policy Central.

## Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: [https://students.mq.edu.au/support/student\\_conduct/](https://students.mq.edu.au/support/student_conduct/)

## Results

Results shown in *iLearn*, or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in [eStudent](#). For more information visit [ask.mq.edu.au](http://ask.mq.edu.au).

## Student Support

Macquarie University provides a range of support services for students. For details, visit <http://students.mq.edu.au/support/>

## Learning Skills

Learning Skills ([mq.edu.au/learningskills](http://mq.edu.au/learningskills)) provides academic writing resources and study strategies to improve your marks and take control of your study.

- [Workshops](#)
- [StudyWise](#)
- [Academic Integrity Module for Students](#)
- [Ask a Learning Adviser](#)

## Student Services and Support

Students with a disability are encouraged to contact the [Disability Service](#) who can provide appropriate help with any issues that arise during their studies.

## Student Enquiries

For all student enquiries, visit Student Connect at [ask.mq.edu.au](http://ask.mq.edu.au)

## IT Help

For help with University computer systems and technology, visit [http://www.mq.edu.au/about\\_us/offices\\_and\\_units/information\\_technology/help/](http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/).

When using the University's IT, you must adhere to the [Acceptable Use of IT Resources Policy](#). The policy applies to all who connect to the MQ network including students.

## Graduate Capabilities

### PG - Discipline Knowledge and Skills

Our postgraduates will be able to demonstrate a significantly enhanced depth and breadth of knowledge, scholarly understanding, and specific subject content knowledge in their chosen

fields.

This graduate capability is supported by:

## **Learning outcomes**

- Understand simple survival models and related properties
- Master the skills to calculate the expected present values and the variances of benefits in standard life assurance and annuity contracts
- Understand the concepts of select and ultimate mortalities and their applications
- Familiar with the calculations of net premiums and reserves under various life insurance contracts
- Able to calculate prospective and retrospective policy values under variable benefits and withprofit life insurance policies
- Understand the costs and profits of life insurance business and be able to calculate gross premiums and reserves

## **Assessment tasks**

- Quiz
- Test
- Examination

## **PG - Critical, Analytical and Integrative Thinking**

Our postgraduates will be capable of utilising and reflecting on prior knowledge and experience, of applying higher level critical thinking skills, and of integrating and synthesising learning and knowledge from a range of sources and environments. A characteristic of this form of thinking is the generation of new, professionally oriented knowledge through personal or group-based critique of practice and theory.

This graduate capability is supported by:

## **Learning outcomes**

- Master the skills to calculate the expected present values and the variances of benefits in standard life assurance and annuity contracts
- Understand the concepts of select and ultimate mortalities and their applications
- Familiar with the calculations of net premiums and reserves under various life insurance contracts
- Able to calculate prospective and retrospective policy values under variable benefits and withprofit life insurance policies
- Understand the costs and profits of life insurance business and be able to calculate gross premiums and reserves



## Assessment tasks

- Quiz
- Test
- Examination

## PG - Research and Problem Solving Capability

Our postgraduates will be capable of systematic enquiry; able to use research skills to create new knowledge that can be applied to real world issues, or contribute to a field of study or practice to enhance society. They will be capable of creative questioning, problem finding and problem solving.

This graduate capability is supported by:

## Learning outcomes

- Able to calculate prospective and retrospective policy values under variable benefits and withprofit life insurance policies
- Understand the costs and profits of life insurance business and be able to calculate gross premiums and reserves

## Assessment tasks

- Test
- Examination