ACST860

Contingent Payments 2

S1 Day 2015

Dept of Applied Finance and Actuarial Studies

Contents

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General Information

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Credit points
4

Prerequisites
ACST859

Corequisites

Co-badged status

Unit description
Topics covered in this unit include: - multiple decrement models; - valuation of benefits and contributions under superannuation plans; - pricing and valuation of policies involving two lives; - cash flow and profit test models for life insurance products including traditional products, unbundled unit linked contracts and disability income products; - pricing and valuation for future contingent liabilities; and - the effect of the pricing and valuation basis on the emergence of profit. Students gaining a grade of credit or higher in both ACST859 and this unit may apply for exemption from subject CT5 of the professional exams of the Institute of Actuaries of Australia.

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:

Extend the techniques learned in ACST859 to permit the calculation and analysis of cashflows dependent upon the death or survival of either or both of two lives, and cashflows dependent upon a fixed term as well as age.

Describe, develop, apply and analyse methods used to model cashflows contingent upon competing risks; construct and use multiple decrement service tables, and demonstrate understanding of the relationship with associated single decrement tables.

Describe, apply and analyse the technique of discounted emerging costs for use in pricing, reserving and assessing profitability, for superannuation funds and related multiple decrement tables, traditional life insurance contracts and unit linked policies.

Define, describe and illustrate the principal forms of heterogeneity within a population and the ways in which selection can occur.

Define, calculate and analyse the use of various single figure indices, explain the rationale behind the indices, and explain the advantages and disadvantages of the indices for summarising and comparing actual experience in different scenarios.

Demonstrate the ability to identify key unit concepts and to integrate them to solve or create novel problems.

Assessment Tasks

Name	Weighting	Due
Assessed coursework	10%	Tuesdays midnight
Class Test	10%	22 April
Assignment	10%	TBA
Final Examination	70%	University Examination Period

Assessed coursework

Due: **Tuesdays midnight**
Weighting: **10%**

The assessed coursework comprises two components - Online quizzes and a peer-reviewed written piece. These two components are worth 10%. More detail is given below.

Online quizzes

The online quizzes are worth 8% total.

There are ten short online quizzes - Quiz 1 is on Section 1, Quiz 2 on Section 2 etc. The quizzes are due Tuesday (at midnight) following the week in which the relevant material is covered - see the Unit Schedule for detailed information.

Quizzes should be submitted online by the due date. You should not leave the submission of quizzes until the last minute in case there are system or other problems. (In the rare case of prolonged University-wide technology problems, allowances will be made for all students).

Please ensure that you answer all quiz questions with the specified rounding, and in the required format. Marks cannot be reinstated for rounding or formatting errors so please do not request this.

No extensions for quizzes will be granted. Students who have not submitted the quiz prior to the deadline will be awarded a mark of 0 for the task, except in cases where an application for Special Consideration is made and approved.

Feedback on each quiz will be made available automatically once the quiz has been submitted and the deadline for the quiz has passed.

Please note that the quizzes aim at assisting your initial learning of concepts, before moving on to more difficult material. They are not indicative of the difficulty of questions you could expect in a test or examination.

Written / peer assessment

The written / peer assessment task is worth 2%.

You will be asked to submit a written task and to carry out peer assessment of others' tasks. Further details and deadlines will be advised in classes.

You will submit your answer and do your peer assessment online. You should not leave your submission / peer assessments until the last minute in case there are system or other problems. (In the rare case of prolonged University-wide technology problems, allowances will be made for all students).

No extensions will be granted. Students who have not submitted the answer or done the peer asssessment by the deadlines will be awarded a mark of 0 for the task, except in cases where an application for Special Consideration is made and approved.

On successful completion you will be able to:
- Extend the techniques learned in ACST859 to permit the calculation and analysis of cashflows dependent upon the death or survival of either or both of two lives, and cashflows dependent upon a fixed term as well as age.
- Describe, develop, apply and analyse methods used to model cashflows contingent upon competing risks; construct and use multiple decrement service tables, and demonstrate understanding of the relationship with associated single decrement tables.
- Describe, apply and analyse the technique of discounted emerging costs for use in pricing, reserving and assessing profitability, for superannuation funds and related multiple decrement tables, traditional life insurance contracts and unit linked policies.
- Define, describe and illustrate the principal forms of heterogeneity within a population

and the ways in which selection can occur.

- Define, calculate and analyse the use of various single figure indices, explain the rationale behind the indices, and explain the advantages and disadvantages of the indices for summarising and comparing actual experience in different scenarios.
- Demonstrate the ability to identify key unit concepts and to integrate them to solve or create novel problems.

Class Test

Due: **22 April**
Weighting: **10%**

The class test will be a 60 minute written paper with 5 minutes reading time, covering lecture materials from Weeks 1 to 5 inclusive.

You are permitted ONE A4 page of paper containing reference material printed on both sides. The material may be handwritten or typed.

Calculators (no text-retrieval capacity) are permitted in the class test. Dictionaries are not permitted. For full marks, clear and complete working must be shown.

No class test extensions will be granted. Students who have not attended the class test will be awarded a mark of 0 for the task, except in cases where an application for Special Consideration is made and approved.

Marked test scripts will be returned via BESS. Class-level results, marking guide and feedback on common errors will be available from the website. Individual results will be provided under Grades on the website. It is intended that marked papers and feedback will be returned within 10 working days of the class test date.

On successful completion you will be able to:

- Extend the techniques learned in ACST859 to permit the calculation and analysis of cashflows dependent upon the death or survival of either or both of two lives, and cashflows dependent upon a fixed term as well as age.
- Describe, develop, apply and analyse methods used to model cashflows contingent upon competing risks; construct and use multiple decrement service tables, and demonstrate understanding of the relationship with associated single decrement tables.

Assignment

Due: **TBA**
Weighting: **10%**

The assignment will be a written report which will be completed in groups. This written report will be submitted via Turnitin, which will be on the course page on iLearn. Only one report may be submitted per group. Further details and the due date will be provided in classes.

No extensions will be granted. Students who have not submitted the assignment by the due date will be awarded a mark of 0 for the task, except in cases where an application for Special Consideration is made and approved.

Class-level results, marking guide and feedback on common errors will be available from the website. Individual results will be provided under Grades on the website.

On successful completion you will be able to:

- Describe, apply and analyse the technique of discounted emerging costs for use in pricing, reserving and assessing profitability, for superannuation funds and related multiple decrement tables, traditional life insurance contracts and unit linked policies.
- Define, describe and illustrate the principal forms of heterogeneity within a population and the ways in which selection can occur.
- Demonstrate the ability to identify key unit concepts and to integrate them to solve or create novel problems.

Final Examination

Due: **University Examination Period**
Weighting: **70%**

The final examination will be a three-hour written paper with ten minutes reading time, held during the University Examination period.

You are permitted ONE A4 page of paper containing reference material printed on both sides. The material may be handwritten or typed. Calculators (no text-retrieval capacity) are permitted in the examination. Dictionaries are not permitted. For full marks, clear and complete working must be shown.

Provisions for Special Consideration for the final examination are outlined under the Policies and Procedures section of this outline.

To be eligible for a passing grade in this unit, a passing grade is required in the final examination.

On successful completion you will be able to:

- Extend the techniques learned in ACST859 to permit the calculation and analysis of cashflows dependent upon the death or survival of either or both of two lives, and cashflows dependent upon a fixed term as well as age.
- Describe, develop, apply and analyse methods used to model cashflows contingent upon competing risks; construct and use multiple decrement service tables, and demonstrate understanding of the relationship with associated single decrement tables.
- Describe, apply and analyse the technique of discounted emerging costs for use in

pricing, reserving and assessing profitability, for superannuation funds and related multiple decrement tables, traditional life insurance contracts and unit linked policies.

- Define, describe and illustrate the principal forms of heterogeneity within a population and the ways in which selection can occur.
- Define, calculate and analyse the use of various single figure indices, explain the rationale behind the indices, and explain the advantages and disadvantages of the indices for summarising and comparing actual experience in different scenarios.
- Demonstrate the ability to identify key unit concepts and to integrate them to solve or create novel problems.

Delivery and Resources

Classes

The timetables for classes can be found on the University website at: http://www.timetables.mq.edu.au. Tutorials will commence in week 2 of the session. All lecture classes for weeks 9 and 10 will be held in the computer lab E4B102.

Required and recommended texts and / or materials

Optional text. Detailed lecture materials are provided and it is not envisaged that you will require a text. If you would like extra reading, the ActEd CT5 notes can be used as an optional text. They can be purchased from http://www.acted.com.au.

Lecture handouts. Lecture handouts are available for downloading from the website in advance of lecture classes. Print these (at 100% size) and bring them to the relevant lecture. It is expected that you will have these notes in all lectures.

Tables. The Formulae and Tables for Actuarial Examinations book is not required for this unit, and will not be provided in the examination. Instead, you will be asked to generate your own set of tables, based on up-to-date UK mortality tables. There will be Tables Tasks exercises set in the early weeks of the unit that will give you details of how to construct the tables and provide results to spot check your answers. In addition to generating results for your future use, the aim of these tasks is to help you to revise relevant results from ACST859. It is important that you keep up-to-date with the Tables Tasks so that you can use your tables to answer questions throughout this unit.

Technology used and required

You will be required to use the teaching website, Excel, Word, R and (in online quizzes) STACK.

Unit webpage

Course material is available on the learning management system (iLearn). To access the teaching website, go to http://ilearn.mq.edu.au and login using your usual login and password.

Teaching and learning activities

Lectures. The unit material is covered in the three hours of lectures each week. You are expected to have pre-read the materials before attending the class. As the semester progresses, the lectures will become more of an interactive workshop session where you are required to take part in discussions and work on the exercises with your peers. Past experience has shown that your understanding of the material is best developed through taking a more active role in your own learning by attempting the exercises, making mistakes and learning how to avoid them, as opposed to simply writing down the steps to lead to a correct answer.

Tutorials. The tutorial is an opportunity for you to discuss the exercises available for each section of work with your tutor. Most tutorials will cover the lecture material from the previous week - further details are given in the Unit Schedule available under the Unit Information section of the website. Tutorials commence in week 2 and there is no tutorial in Week 13 due to the public holiday.

Computer lab classes. These will replace all of the lecture classes in weeks 9 and 10.

Material to bring to classes. You are expected to bring to all classes the relevant lecture handout printout for the current and previous weeks, blank paper to complete exercises, a calculator, and your completed Tables Tasks.

Changes since the last offering of this unit

This year's offering is predominantly the same as the previous semester's offering, with a slight change in the order of the lecture topics to include a revision lecture prior to the class test.

Unit Schedule

The unit schedule (including details of assessment tasks with due dates and tutorials) is given below :

Week	Date (Starting Monday)	Lecture Topic	Lecturer
1	23 Feb	Introduction to Unit, Joint Life Distributions	PdJ
2	2 Mar	Simple Assurances and Annuities for Joint Life Functions	PdJ
3	9 Mar	Contingent and Reversionary Benefits	PdJ
4	16 Mar	Competing Risks	BC
5	23 Mar	Multiple Decrement Tables	BC
6	30 Mar	Revision for Class Test	BC
Mid-Semester Break (3 Apr - 19 Apr)			
7	20 Apr	Class Test (Covers Weeks 1-5 inclusive)	
8	27 Apr	Superannuation Benefits	BC

9	4 May	Profit Testing 1 - Conventional Business	BC
10	11 May	Profit Testing 2 - Unit-Linked Business	BC
11	18 May	Mortality Risk Factors and Selection	BC
12	25 May	Mortality Indices	BC
13	2 Jun	Course Evaluation, Revision	BC

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

Assessment Policy http://mq.edu.au/policy/docs/assessment/policy.html

Grading Policy http://mq.edu.au/policy/docs/grading/policy.html

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

Grievance Management Policy http://mq.edu.au/policy/docs/grievance_management/policy.html

Disruption to Studies Policy 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/

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.

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) 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

IT Help

For help with University computer systems and technology, visit http://informatics.mq.edu.au/help/.

When using the University's IT, you must adhere to the Acceptable Use Policy. The policy applies to all who connect to the MQ network including students.

Supplementary Examinations

For information about supplementary examinations (which in session 1 2015 will be held in mid-July), see http://www.businessandeconomics.mq.edu.au/current_students/undergraduate/how_do_i/special_consideration

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

- Extend the techniques learned in ACST859 to permit the calculation and analysis of cashflows dependent upon the death or survival of either or both of two lives, and cashflows dependent upon a fixed term as well as age.
- Describe, develop, apply and analyse methods used to model cashflows contingent upon competing risks; construct and use multiple decrement service tables, and demonstrate understanding of the relationship with associated single decrement tables.
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multiple decrement tables, traditional life insurance contracts and unit linked policies.

- Define, describe and illustrate the principal forms of heterogeneity within a population and the ways in which selection can occur.
- Define, calculate and analyse the use of various single figure indices, explain the rationale behind the indices, and explain the advantages and disadvantages of the indices for summarising and comparing actual experience in different scenarios.

Assessment tasks

- Assessed coursework
- Class Test
- Assignment
- Final 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

- Extend the techniques learned in ACST859 to permit the calculation and analysis of cashflows dependent upon the death or survival of either or both of two lives, and cashflows dependent upon a fixed term as well as age.
- Describe, develop, apply and analyse methods used to model cashflows contingent upon competing risks; construct and use multiple decrement service tables, and demonstrate understanding of the relationship with associated single decrement tables.
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- Define, describe and illustrate the principal forms of heterogeneity within a population and the ways in which selection can occur.
- Demonstrate the ability to identify key unit concepts and to integrate them to solve or create novel problems.

Assessment tasks

- Assessed coursework

- Class Test
- Assignment
- Final 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

- Describe, apply and analyse the technique of discounted emerging costs for use in pricing, reserving and assessing profitability, for superannuation funds and related multiple decrement tables, traditional life insurance contracts and unit linked policies.
- Define, describe and illustrate the principal forms of heterogeneity within a population and the ways in which selection can occur.
- Demonstrate the ability to identify key unit concepts and to integrate them to solve or create novel problems.

Assessment tasks

- Assignment
- Final Examination

Feedback

Your feedback on the unit is always welcome. There have been a number of changes made to the teaching and assessment in the unit in recent years in response to feedback. I hope that you find the unit an interesting learning experience.

Piet de Jong, Unit Convenor

Research and Practice

This unit uses research by Macquarie University researchers, as well as research from external sources (references are given in the unit notes).