ACST255

Contingent Payments 1

S2 Day 2019

Department of Actuarial Studies and Business Analytics

Contents

General Information 2

Learning Outcomes 3

General Assessment Information 3

Assessment Tasks 3

Delivery and Resources 6

Unit Schedule 6

Policies and Procedures 7

Graduate Capabilities 8

Changes from Previous Offering 10

Research and Practice, Global and Sustainability 10

Disclaimer

Macquarie University has taken all reasonable measures to ensure the information in this publication is accurate and up-to-date. However, the information may change or become out-dated as a result of change in University policies, procedures or rules. The University reserves the right to make changes to any information in this publication without notice. Users of this publication are advised to check the website version of this publication [or the relevant faculty or department] before acting on any information in this publication.

General Information

Unit convenor and teaching staff

Unit Convenor
Yanlin Shi
yanlin.shi@mq.edu.au
Contact via email
Room 729, 4 Eastern Road
Refer to iLearn

Lecturer
Simon Guthrie
simon.guthrie@mq.edu.au
Room 616, 4 Eastern Rd
Refer to iLearn

Credit points
3

Prerequisites
(Admission to BActStud or BActStudBSc or BAppFinBActStud or BActStudBProfPrac) and ACST152 and ACST202 and STAT272 and GPA of 4.5 (out of 7.0)

Corequisites

Co-badged status

Unit description
This unit covers the analysis of cash flows dependent on uncertain events due to mortality and other factors. It introduces the concept of the expected present value of payments under various life insurance contracts, including whole life, term and endowment assurances; immediate and temporary annuities; and deferred assurances and annuities. The standard international actuarial notation in life insurance is used extensively. Probability models and life tables are used to calculate the expected present values accurately based on ultimate or select mortality. Furthermore, important concepts of pricing and reserving for future contingent liabilities are discussed. Equations of value are established to calculate net premiums. Prospective and retrospective net premium reserves required to meet future liabilities are determined and compared. The concepts and methods are then extended to gross premiums and reserves that make allowance for profits and expenses. Students gaining a grade of credit or higher in both ACST255 and ACST355 are eligible 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:

Understand simple survival models, select and ultimate mortality rates and their applications.

Illustrate the calculation of expected present values and variances of benefits for simple life insurance contracts.

Apply the calculation of premiums and policy values for various life insurance contracts, both with and without allowance for operating expenses.

Be able to analyse the profit arising from life insurance contracts in simple scenarios.

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

General Assessment Information

For all assessments:

- Assessment criteria for all assessment tasks will be provided on the unit iLearn site.
- All individual assessment results will be made available under Grades on the website.
- It is the responsibility of students to view their marks for each within-session assessment on iLearn within 20 working 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 marks (not including the final exam mark) will not be addressed.
- In the cases where a special consideration application is approved, the student may be offered an alternative assessment or may receive a mark based on the percentage mark achieved by the student in one or more other assessment tasks, at the unit convenor's discretion.

Assessment Tasks

Name	Weighting	Hurdle	Due
Online Quiz	5%	No	19 August

Name	Weighting	Hurdle	Due
Assignment	15%	No	13 September
Class Test	20%	No	23 October
Final Examination	60%	No	Exam period

Online Quiz

Due: **19 August**
Weighting: **5%**

Online quiz on Week 1 and 2 lectures.

You should complete the quiz online. It is on this unit's iLearn web site. For details of the quiz, please refer to iLearn.

On successful completion you will be able to:

- Understand simple survival models, select and ultimate mortality rates and their applications.
- Illustrate the calculation of expected present values and variances of benefits for simple life insurance contracts.
- Demonstrate the ability to identify key unit concepts and to integrate them to solve and analyse novel problems.

Assignment

Due: **13 September**
Weighting: **15%**

The assignment involves using a spreadsheet to investigate efficient calculation methods for some of the assurance and/or annuity functions considered in this unit.

Assignments should be submitted via the tool on the unit's iLearn web site.

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 special consideration is made and approved. No submission will be accepted after solutions have been posted.

On successful completion you will be able to:

- Understand simple survival models, select and ultimate mortality rates and their applications.

- Illustrate the calculation of expected present values and variances of benefits for simple life insurance contracts.
- Demonstrate the ability to identify key unit concepts and to integrate them to solve and analyse novel problems.

Class Test

Due: **23 October**
Weighting: **20%**

The class test will be a 1.5-hour written paper with no reading time, held during the lecture time on Oct 23, Friday. It will cover course materials of weeks 3-9.

You are permitted ONE A4 page of paper containing reference material printed on both sides. The material may be handwritten or typed. The page will not be returned to you at the end of the class test.

Students who have not sat the test will be awarded a mark of 0 for the task, except for cases in which an application for special consideration is made and approved.

On successful completion you will be able to:

- Understand simple survival models, select and ultimate mortality rates and their applications.
- Illustrate the calculation of expected present values and variances of benefits for simple life insurance contracts.
- Apply the calculation of premiums and policy values for various life insurance contracts, both with and without allowance for operating expenses.
- Be able to analyse the profit arising from life insurance contracts in simple scenarios.
- Demonstrate the ability to identify key unit concepts and to integrate them to solve and analyse novel problems.

Final Examination

Due: **Exam period**
Weighting: **60%**

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. The page will not be returned to you at the end of the final examination.

On successful completion you will be able to:

- Understand simple survival models, select and ultimate mortality rates and their applications.
- Illustrate the calculation of expected present values and variances of benefits for simple life insurance contracts.
- Apply the calculation of premiums and policy values for various life insurance contracts, both with and without allowance for operating expenses.
- Be able to analyse the profit arising from life insurance contracts in simple scenarios.
- Demonstrate the ability to identify key unit concepts and to integrate them to solve and analyse novel problems.

Delivery and Resources

Classes

There are 4 hours of face-to-face teaching per week consisting of 3 hours of lectures and 1 hour of tutorial.

The timetables for classes can be found on the University website at: https://timetables.mq.edu.au/2019/.

Tutorials commence in week 2 of the session.

Required and Recommended Texts and/or Materials

No textbooks are prescribed for this unit. Detailed notes, exercises and solutions are available on the unit's web site.

Technology Used and Required

You will require a calculator. For the final exam, you may only use non-programmable calculators which are not able to store text.

You may find it useful to be able to construct spreadsheets to verify your solutions to tutorial exercises. You will also be required to use a spreadsheet for the assignment. We do not prescribe any particular brand of spreadsheet.

You require access to a computer to access material on the unit's iLearn web site.

Unit Webpage

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

Unit Schedule

Since students often seem to print the schedule of topics, it is provided as a separate printer-friendly document in the administration section of this unit's iLearn web site.

Policies and Procedures

Macquarie University policies and procedures are accessible from Policy Central (https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central). Students should be aware of the following policies in particular with regard to Learning and Teaching:

- Academic Appeals Policy
- Academic Integrity Policy
- Academic Progression Policy
- Assessment Policy
- Fitness to Practice Procedure
- Grade Appeal Policy
- Complaint Management Procedure for Students and Members of the Public
- Special Consideration Policy *(**Note:** The Special Consideration Policy is effective from 4 December 2017 and replaces the Disruption to Studies Policy.)*

Undergraduate students seeking more policy resources can visit the Student Policy Gateway (https://students.mq.edu.au/support/study/student-policy-gateway). It is your one-stop-shop for the key policies you need to know about throughout your undergraduate student journey.

If you would like to see all the policies relevant to Learning and Teaching visit Policy Central (https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/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/study/getting-started/student-conduct

Results

Results published on platform other than eStudent, (eg. iLearn, Coursera etc.) 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 or if you are a Global MBA student contact globalmba.support@mq.edu.au

Supplementary exams

Information regarding supplementary exams, including dates, is available at:

http://www.businessandeconomics.mq.edu.au/current_students/undergraduate/how_do_i/disruption_to_studies

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

If you are a Global MBA student contact globalmba.support@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/.

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

Discipline Specific Knowledge and Skills

Our graduates will take with them the intellectual development, depth and breadth of knowledge, scholarly understanding, and specific subject content in their chosen fields to make them competent and confident in their subject or profession. They will be able to demonstrate, where relevant, professional technical competence and meet professional standards. They will be able to articulate the structure of knowledge of their discipline, be able to adapt discipline-specific knowledge to novel situations, and be able to contribute from their discipline to inter-disciplinary solutions to problems.

This graduate capability is supported by:

Learning outcomes

- Understand simple survival models, select and ultimate mortality rates and their

applications.

- Illustrate the calculation of expected present values and variances of benefits for simple life insurance contracts.
- Apply the calculation of premiums and policy values for various life insurance contracts, both with and without allowance for operating expenses.
- Be able to analyse the profit arising from life insurance contracts in simple scenarios.
- Demonstrate the ability to identify key unit concepts and to integrate them to solve and analyse novel problems.

Assessment tasks

- Online Quiz
- Assignment
- Class Test
- Final Examination

Critical, Analytical and Integrative Thinking

We want our graduates to be capable of reasoning, questioning and analysing, and to integrate and synthesise learning and knowledge from a range of sources and environments; to be able to critique constraints, assumptions and limitations; to be able to think independently and systemically in relation to scholarly activity, in the workplace, and in the world. We want them to have a level of scientific and information technology literacy.

This graduate capability is supported by:

Learning outcomes

- Understand simple survival models, select and ultimate mortality rates and their applications.
- Illustrate the calculation of expected present values and variances of benefits for simple life insurance contracts.
- Apply the calculation of premiums and policy values for various life insurance contracts, both with and without allowance for operating expenses.
- Be able to analyse the profit arising from life insurance contracts in simple scenarios.
- Demonstrate the ability to identify key unit concepts and to integrate them to solve and analyse novel problems.

Assessment tasks

- Online Quiz
- Assignment
- Class Test

- Final Examination

Problem Solving and Research Capability

Our graduates should be capable of researching; of analysing, and interpreting and assessing data and information in various forms; of drawing connections across fields of knowledge; and they should be able to relate their knowledge to complex situations at work or in the world, in order to diagnose and solve problems. We want them to have the confidence to take the initiative in doing so, within an awareness of their own limitations.

This graduate capability is supported by:

Learning outcomes

- Understand simple survival models, select and ultimate mortality rates and their applications.
- Illustrate the calculation of expected present values and variances of benefits for simple life insurance contracts.
- Apply the calculation of premiums and policy values for various life insurance contracts, both with and without allowance for operating expenses.
- Be able to analyse the profit arising from life insurance contracts in simple scenarios.
- Demonstrate the ability to identify key unit concepts and to integrate them to solve and analyse novel problems.

Assessment tasks

- Online Quiz
- Assignment
- Class Test
- Final Examination

Changes from Previous Offering

The assessment scheme has been adjusted to include an assignment and an online quiz.

Research and Practice, Global and Sustainability

Survival analysis and the valuation of contingent payments has a long history. The techniques we are using can be found in textbooks on mathematics of finance, rather than needing to source recent research papers.

While some topics in this unit will use Australian jargon and mention Australian market features, the mathematical concepts in this unit are independent of any legislative constraints and so do not recognise national or planetary boundaries.