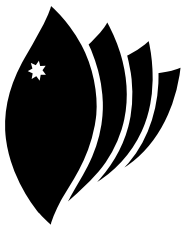

MACQUARIE UNIVERSITY

FACULTY OF
BUSINESS AND ECONOMICS

ACST860
Contingent Payments 2

Semester 2, 2011

Department of Applied Finance and Actuarial Studies

MACQUARIE UNIVERSITY
FACULTY OF BUSINESS AND ECONOMICS
UNIT GUIDE

Year and Semester: **Semester 1, 2011**

Unit convenor: **Sachi Purcal**

Prerequisites: **ACST859**

Credit points: **4**

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

This unit develops models for the analysis of cash flows depending on uncertain events (i.e., payments contingent on uncertain events, hence "contingent payments"). In particular, we will look at payments under policies involving two lives, models of competing risks, multiple decrement models and the valuation of benefits and contributions under superannuation plans. We will develop expected cash flow models and profit test models for various life insurance products, and will consider the effect of the pricing and policy value basis on the emergence of profit. We will begin by considering factors affecting mortality, types of selection, and issues around risk classification.

A good knowledge of the material covered in ACST859 is essential. You should revise these units as soon as possible if necessary.

TEACHING STAFF

Sachi Purcal is the unit convenor and will be taking all of the lectures in this unit. He can be contacted by email (sachi.purcal@mq.edu.au) or on 9850-8571.

CONSULTATION TIMES

Questions about unit content can be sent to the Discussion Board of the website. Posting and responding to questions using the Discussion Board can be a very effective way to learn, and you are encouraged to make active use of the Discussion Board.

Alternatively you can ask questions during lecture breaks, tutorials or consultation hours.

Sachi Purcal has consultation in his office E4A 615 on Thursday 10–12. Consultation sessions run during teaching weeks only. In special circumstances, an appointment may be made outside regular consultation hours.

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

CLASSES

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

Lectures are held Fridays 0800–1100 in W6B 325. The unit material is covered in the three hours of lectures each week.

Tutorials are held Friday 1100–1200, commencing in week 1. It is held in E6A 109.

Computer lab sessions will replace some lecture and tutorial classes in weeks 10, 11and 12. See *Teaching and Learning Strategy* later in this unit outline.

Any alterations to classes will be advised in lectures and / or via the website.

PRIZES

The Peter Hains Memorial Prize for Actuarial Studies may be awarded for proficiency in this unit.

EXEMPTION

The units ACST 859 and ACST 860 together correspond to the professional subject CT5. The exemption will be recommended if and only if a SNG of at least 60 is achieved in both units and the average SNG is at least 65.

REQUIRED AND RECOMMENDED TEXTS AND/OR MATERIALS

Optional text

The ActEd CT5 notes are an optional text. Those who completed ACST 859 in 2009 or first semester 2010 should already have these notes. It is recommended that you read the optional reading from the ActEd notes in advance of the lecture. During the lecture you can then work through the lecture handout, which will cover similar ground as the ActEd notes but expressed in a different way.

Lecture notes

Lecture Handouts (i.e., notes with gaps) are available for downloading from the unit website under Unit Notes. **Print these in advance and bring them to the relevant lecture to complete. It is expected that you will have the notes in lectures.**

Complete notes including solutions to lecture exercises will be made available for downloading from the ACST 860 website at 1200 on the Friday on which the relevant section of work is completed (e.g., if we complete Section 1 in week 1, the complete notes will become available at 1200 Friday of week 1). Solutions to section exercises will be made available at 1800 on that same day. **This schedule is fixed and will not be varied for individual students unless the formal grounds for Special Consideration or Equity Support are met.**

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 various weeks 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 ACST 859. **It is important that you keep up-to-date with the Tables Tasks sothat you can use your tables to answer questions throughout this unit.**

TECHNOLOGY USED AND REQUIRED

You will required to use Blackboard, word processing software (like Word), spreadsheet software (like Excel) and be able to create and read pdf files.

UNIT WEB PAGE

Course material is available on the learning management system (Blackboard). To access the teaching website, go to http://learn.mq.edu.au and login using your usual login and password. You will then have access to the websites for all the units in which you are enrolled. If you have any trouble logging in (e.g., you have forgotten your password), please contact the Student IT Helpdesk in C5C 244.

Before logging in, you should follow the link labelled “Technical Information” and read all the information there, including the Information *Technology Security Policy and Rules* and the *Information Technology Usage Rules*. This technical information also mentions a number of “plugins” that may be required. Of those listed, in this unit you will only need Acrobat Reader. Remember to 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 web site will be used as an integral part of this unit. The main components of the website (listed on the left hand side toolbar) are:

Course Content

- Unit Outline and Administrative Information: You can download this unit outline from here. Other administrative information will be posted here during the semester.

- Unit Notes: Notes including Lecture Handouts – Complete Set, complete unit notes for each section, solutions to exercises for each section, and spreadsheet templates, are posted here for downloading.
- Assessments: Data and templates for the quizzes and assignments will be made available here, along with best student attempts at the assessments.
- Tables Tasks: The data and shell spreadsheets you need to complete the TablesTasks will be made available here.
- Revision exercises: Additional revision exercises will be made available here.
- Tests and exams: Previous examinations and tests for ACST345 and ACST355 / 860 are available here. (ACST355 was offered for the first time in 2006. ACST345 was offered until 2005 and covered some of the same content as ACST355.)
- Links: Any web links you need to use will be made available here.

Announcements. Administrative announcements will be posted here.

Assessments. Submit your weekly quizzes and four online assignments here.

Assignments. Enter this section to submit your answers to the long answer questions of Assignments 1, 2 and 3.

Calendar. The calendar will list the dates that some items of assessment become available; however it is your responsibility to familiarise yourself with all assessment requirements including those not listed on the calendar.

Discussions. You should use the 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.

Mail. You should use private Mail to send administrative queries to the unit convenor or teaching administrator. Staff will also use private Mail to contact you individually, if necessary. You may also use this facility to contact your fellow students. It is your responsibility to check the website regularly to make sure that you are up-to-date with messages sent to your private Mail address.

Search. Use this tool to search the website.

Web links. Links to relevant websites are available here.

iLectures. Audio of each lecture along with synchronised video output from the PC and visualiser will be made available for all lectures on this tab.

LEARNING OUTCOMES

The broad learning objectives of this unit are as follows. The learning outcomes as well as the specific learning objectives are given in the lecture notes at the start of each section of work. You should review these in advance of each lecture and after completing each section of work.

1. Explain the concept of a single figure index and its advantages and disadvantages for summarising and comparing actual experience. Define, calculate and illustrate the use of various single figure indices.
2. Describe the principal forms of heterogeneity within a population and the ways in which selection can occur.
3. Extend the techniques learned in ACST255 / 859 to deal with 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.
4. Describe, develop and apply methods that can be used to model cashflows contingent upon competing risks.
5. Construct and use multiple decrement service tables, and demonstrate understanding of the relationship with associated single decrement tables.
6. 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.

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.
    e. Have skills in fitting and assessing the reliability of statistical models, particularly in the context of financial applications.
    f. Have the ability to develop methods for measuring and manipulating the range of decrement rates relevant to actuarial practice.
2. Critical, Analytical and Integrative Thinking
3. Problem Solving and Research Capability

TEACHING AND LEARNING STRATEGY

Lectures. The unit material is covered in the three hours of lectures each week.

Tutorials. The tutorial is an opportunity for you to attempt the section exercises given in the lecture notes at the end of each section, and to discuss problems with the tutor. Tutors will also go through one or two short additional questions in the tutorial. The additional tutorial questions will not be made available on the website or in hardcopy, or to students not attending the tutorial, so please do not request this.

You must attend the tutorial in which you are enrolled.

Computer lab sessions will replace some lecture and tutorial classes in weeks 10, 11 and 12. Locations will be advised on Blackboard.

Material to bring to classes
You are expected to bring to all classes:

- the relevant pages of the Lecture Handouts – Complete Set, to complete during classes; and (for tutorials) a copy of the section exercises from Lecture HandoutsComplete Set;
- completed Lecture Handouts for previous sections of work;
- blank paper, to complete exercises;
- a calculator;
- your completed Tables Tasks, so that you can refer to tables when completing
- exercises.

Schedule of Classes and Assessments
A schedule of classes and assessments is given below. This may be adapted as the semester proceeds. Any alterations to classes or assessment due dates will be advised in lectures and / or via the website.

Week	Week Beginning	Due Thursday 1700	Friday 0800–1100 class	Friday 1100–1200 class
1	21 February	–	1. Mortality indices	Tutorial: section 1
2	28 February	Quiz 1	2. Mortality risk factors and selection	Tutorial: section 2
3	07 March	Quiz 2	3. Simple annuities and assurances involving two lives	Tutorial: section 3
4	14 March	Quiz 3	4. Contingent and reversionary benefits	Tutorial: section 4
5	21 March	Quiz 4, Assignment 1	5. Competing risks	Tutorial: section 5
6	28 March	Quiz 5	6. Multiple	Tutorial:

			decrement tables	section 6 (Q1–5)
7	04 April	Assignment 2	6.+7. Superannuation funds	Tutorial: section 6 (Q6–9) and additional question for section 7.
Study break	11 April 18 April	Quiz 6 –		
8	25 April	Assignment 3	7. + mock test	Mock test feedback; opportunity for questions about the test.
9	02 May	–	7. + test	Tutorial: section 7
10	09 May	Quiz 7	8. Profit testing	Lab: section 8
11	16 May	Quiz 8	9. Determining provisions using profit testing	Lab: section 9
12	23 May	Quiz 9	10. Profit testing– additional exercises	Lab: section 10
13	30 May	Assignment 4	Unit surveys, exam information, revision	Revision

RESEARCH AND PRACTICE

- This unit uses research by Macquarie University researchers (references are given in the unit notes)
- This unit uses research from external sources (references are given in the unit notes)
- This unit gives you practice in applying research findings in your assignments
- This unit gives you opportunities to conduct your own research

RELATIONSHIP BETWEEN ASSESSMENT AND LEARNING OUTCOMES

This unit is assessed using a class test, regular short quizzes, a series of assignments and a final examination. (You will also be provided with non-assessable short questions to attempt during the tutorial, as well as section exercises to attempt during the tutorial and in your own time.) The assessment structure is suitable given

the problem–solving and technical nature of the unit, and is also aimed at encouraging you to regularly review the material. An assessment schedule is given on the previous page and any changes to the assessment or assessment due dates will be advised in classes.

The quiz questions and short tutorial questions (and to some extent, the assignment questions) are aimed at helping you to understand the fundamental concepts, before moving on to more difficult material. **They are not necessarily indicative of the difficulty of questions you could expect in the class tests and on the final exam** (ie. they are mostly easier, to assist your initial learning).

Quizzes and Assignments
The nine quizzes are worth a total 5% of the final assessment for the unit. Each quiz is based on the material in one section of the unit (Quiz 1 is based on material in Section 1, Quiz 2 is based on material in Section 2, … Quiz 9 is based on material in Section 9) but may also use some earlier work.

The four assignments are worth a total of 12% of the final assessment for the unit.

Quizzes and assignments are to be submitted online by the due dates shown on the preliminary schedule. You should not leave the submission of quizzes or assignments to the last minute in case there are system problems that cause delays. (In the rare case of prolonged University-wide technology problems, allowances will be made for all students). You should ensure that you fully Submit each item of assessment and receive the acknowledgement “Thank you for submitting Quiz 1” etc. Feedback on each quiz and assignment will be available online once the assessment has been submitted and the deadline for the assessment has passed.

You must submit a quiz / assignment, in order to be able to access the questions and solutions throughout the semester. **Quizzes and assignments cannot subsequently be made available to students who do not submit an attempt** so please do not request this.

Quizzes 1 and 2 are used as early diagnostic tools to assess how well you are understanding the unit material and whether you need to revise pre-requisite material or to reconsider your enrolment in the unit. If you score less than 60% in these assessment tasks you should contact the unit convenor to discuss your options.

Class test
The test is worth 13% of the final assessment for the unit. It is scheduled for Friday 6 May at 0900, and will cover Sections 1 to 6 inclusive. It will be a 75 minute written paper. The class test date, time, format and coverage may be subject to change – any changes will be advised in lectures and / or on the unit website.

Class level results, marking guide and feedback on common errors will be provided on the website. **It is intended that marked papers and feedback will be returned within 12 working days** of the class test date.

Exam
A final examination is included as an assessment task for this unit to provide

assurance that:

- the product belongs to the student and
- the student has attained the knowledge and skills tested in the exam.

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

The University Examination period in First Half Year 2011 is from 6 June to 17 June.

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://www.timetables.mq.edu.au/exam

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

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

	Class test	Assignments (four)	Online quizzes (nine)	Final exam
Description	In-class test	Combination of online and written questions	Online questions	Formal exam
Due date	6 May	See schedule	See schedule	Exam period
% Weighting	13	12 (total)	5 (total)	70
Grading method	Mark out of 40 provided. Marking system is given on test paper.	Mark provided. Marking system is given in assignments.	Mark provided. Marking system is given in quizzes.	Mark provided. Marking system is given on exam paper.
Submission method	In-class	Online	Online	Formal exam
Feedback	Class-level and individual, within 12 days of assessment	Online, within 1 day of the deadline for submission	Online, within 1 day of the deadline for submission	None
Estimated student workload (hours)	8–12	15–25	12–20	15–27
Learning outcomes assessed				
1	✓	✓	✓	✓
2	✓	✓	✓	✓
3	✓	✓	✓	✓
4	✓	✓	✓	✓
5	✓	✓	✓	✓
6		✓	✓	✓
Graduate capabilities assessed				
1(a)	✓	✓	✓	✓
1(b)	✓	✓	✓	✓
1(c)	✓	✓	✓	✓
1(d)	✓	✓	✓	✓
1(e)	✓	✓	✓	✓
1(f)	✓	✓	✓	✓
2	✓	✓	✓	✓
3		✓		✓

RULES REGARDING TESTS AND EXAMINATIONS

You should ensure that your handwriting in the class tests and in the final examination is legible. Sections of work that are not legible will not be marked. For

true/false questions, answers that are not clearly legible as either T or F will be assumed to be wrong and marked accordingly.

You are permitted to bring to the class test and the final examination, **ONE** A4 sheet of paper containing reference material printed on both sides. The sheet may be handwritten, typed or photo–reduced. Any mortality or statistical tables that you require will be provided for you in the class tests and the final examination.

Calculators will be allowed in the class tests and the final examination but a clear indication of the steps involved in every calculation must be shown. Any machines that 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 tests 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 tests 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 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/procedure.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.

ACSTINFO. This ACSTINFO site is used to distribute information to all students majoring in actuarial studies. The information supplied may include administrative information and job advertisements. You will retain access to this site during the vacation following the end of this semester. It is to your advantage to ensure you read information on this web site regularly. You should not assume that information posted there will also be repeated in lectures. To access the site, login at: http://learn.mq.edu.au/ and the site should appear among your list of units. When you first login, please read the section labelled “How to use this site.” This contains useful information which will help you determine when there is new information on the site which you should read.

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.

Institute of Actuaries of Australia

The Institute of Actuaries of Australia (IAAust) has recently launched a new free offer for students to become IAAust University Subscribers. Full time undergraduates studying at an Institute accredited university who are members of a university student actuarial society are eligible. To sign up, go to http://www.actuaries.asn.au/Membership/MembershipoftheInstitute/Subscriber.aspx.

The University Subscriber offer is not a membership of the IAAust but a subscription to receive information on career opportunities, invitations to selected IAAust events and online publications. You might also consider joining the IAAust—there are advantages in doing so while a full-time student. For membership information, go to http://www.actuaries.asn.au/Membership/MembershipoftheInstitute.aspx