



Australian  
National  
University

**Research School of  
Finance, Actuarial Studies and Applied Statistics**

**STAT4031/STAT8040**

**Actuarial Control Cycle A1**

**Semester 1, 2012**

**Lecturer:  
Bridget Browne**



# **STAT4031/STAT8040**

## **ACTUARIAL CONTROL CYCLE 1**

### **Introduction**

Part II of the Institute of Actuaries of Australia's Fellowship requirements comprises Part IIA - the Actuarial Control Cycle - and Part IIB - Investment and Asset Modelling.

At ANU the Actuarial Control Cycle comprises STAT4031/STAT8040 offered in First Semester and STAT4032/STAT8041 offered in Second Semester. Investment and Asset Modelling is offered as STAT4033/STAT8033 in Second Semester.

For the purposes of the Institute exemptions the achievement of a satisfactory standard (see below) across the combination of all three units - STAT4031/STAT8040, STAT4032/STAT8041 and STAT4033/STAT8042 - will provide an exemption from Part II.

This is the Course Outline for STAT4031/STAT8040.

## Assessment

The assessment is as follows

	<b>STAT4031 STAT8040</b>
Examination	70%
Assignment 1	10%
Assignment 2	20%

The examination arrangements are as follows

	<b>STAT4031 STAT8040</b>
Duration	3 hours
Location	PC Lab

The examination takes place at the end of the semester.  
There is no mid-semester examination.

The assignment lengths and due dates are as follows:

<b>STAT4031 STAT8040</b>	<b>Length</b>	<b>Due Date</b>
Assignment 1	2000 words	9:00am Friday 13 April 2012
Assignment 2	4000 words	9:00am Friday 25 May 2012

Submission will be via the assignment submission function of the Wattle site only. The topic for each assignment for STAT4031/STAT8040 is shown later in this document.

## Assignment Submission

Assignments **MUST** have a completed cover page. An assignment submitted without a cover sheet will NOT be marked. All assignments are to be submitted electronically through Wattle.

Each assignment has a due date. Assignments which are submitted after the due date will suffer a penalty of a deduction of 10% of the maximum marks available for that assignment PLUS another 5% for each working day late. After 10 working days late the assignment will not be marked.

Applications may be made for extensions of the due date in the event of material and unforeseen events. Workload in other courses or paid employment are not acceptable reasons for an extension!

## **Important note regarding assessment**

Your final mark for the course will be based on the above assessment formulae. However, your mark **will not** be the same number as produced by that formula, as scaling of marks will be necessary to obtain an appropriate distribution of grades relative to other Graduate subjects. The scaling applied will preserve the order of marks i.e. if your raw mark exceeds that of another student, then your scaled mark will exceed the scaled mark of that student, and may be either up or down.

## **Exemption Standard**

The standard for exemptions from the Institute Part II is achievement of a weighted Distinction grade average (70% or better) over the combination of each of the three units STAT4031/8040, STAT4032/8041 and STAT4032/8033, with a minimum requirement of 60% in each unit.

The weights will be

STAT4031/8040 33.3%  
STAT4032/8041 33.3%  
STAT4033/8033 33.3%

## **STAT4031/STAT8040 Lecture Times**

Classes take place on Tuesday from 11am to 1pm (2 hour session) and Wednesday from 12pm to 1pm (1 hour session).

Lectures and cases studies will be in Lecture Theatre 4 of CBE Building 26C.

The PC Lab sessions (Tuesday sessions in Week 9, 10 and 11) will be in Copland G025.

## **Reading List**

Relevant reading material will be distributed via Wattle during the semester.

## **Communication with students**

**Email** If necessary students will be contacted electronically using their official ANU student email address.

**Announcements** Students are expected to check the Wattle site for announcements about this course, e.g. changes to timetables or notifications of cancellations. Notifications of emergency cancellations of lectures or tutorials will be posted on the door to the relevant room.

**Lecturer Contact** **Bridget Browne** is available Tuesday and Wednesday. It is best to email to make an appointment:

[bridget.browne@anu.edu.au](mailto:bridget.browne@anu.edu.au)

Office: Building 26C Room 3.58  
Phone: 02 6125 7373

## **General Information for all Students**

This can be found on the Wattle site.

## STAT4031/STAT8040 - Semester 1 Program

<b>Week</b>	<b>Date</b>	<b>Type</b>	<b>Syllabus Item</b>	<b>Details</b>
<b>1</b>	21 Feb	Lecture	1	The Control Cycle
	22 Feb	Lecture	2	General Environment
<b>2</b>	28 Feb	Lecture	2 / 3	General Environment / Financial Services Marketplace
	29 Feb	Lecture	3	Financial Services Marketplace
<b>3</b>	6 Mar	Lecture	3	Financial Services Marketplace
	7 Mar	Lecture	3	Financial Services Marketplace
<b>4</b>	13 Mar	Lecture	3	Financial Services Marketplace
	14 Mar	Lecture	4	Regulation
<b>5</b>	20 Mar	Lecture	5	Capital
	21 Mar	Lecture	4	Regulation
<b>6</b>	27 Mar	Lecture	6	Enterprise Risk Management
	28 Mar	Lecture	6	Enterprise Risk Management
<b>7</b>	3 Apr	Lecture	6	Enterprise Risk Management
	4 Apr	Lecture	6	Enterprise Risk Management
Mid Semester Break				
<b>8</b>	24 Apr	CASE STUDY /Lecture	6 / 7	Enterprise Risk Management / Modelling
	25 Apr			ANZAC DAY Public Holiday
<b>9</b>	1 May	PC LAB	7	Modelling
	2 May	Lecture	7	Modelling
<b>10</b>	8 May	PC LAB	7	Modelling
	9 May	Lecture	8	Product Design
<b>11</b>	15 May	PC LAB/CS	7	Modelling Case Study
	16 May	Lecture	8	Product Design
<b>12</b>	22 May	CASE STUDY	8	Product Design Case Study
	23 May	Lecture	ALL	Review
<b>13</b>	29 May	Lecture	9	Professionalism
	30 May	Lecture	ALL	Review

## **STAT4031/STAT8040 Assignments**

### **Assignment 1**

2000 words

Due: 9:00am Friday 13 April 2012

Covers material up to and including Week 5.

## **STAT4031/STAT8040 Assignments**

### **Assignment 2**

4000 words

Due: 9:00am Friday 25 May 2012

Covers material from Week 6 to Week 11 inclusive.

## **Detailed Syllabus**

## **STAT4031/STAT8040 Actuarial Control Cycle A1 - Syllabus**

### **1. Discuss and Apply an Actuarial Control Cycle in a Variety of Practical Commercial Situations**

- a) Identify the elements of the Control Cycle and how the elements interrelate in an actuarial context
- b) Recognise the various stakeholders involved in a variety of situations involving medium and long-term commercial decisions and demonstrate how the use of the Control Cycle can add value in resolving issues between the stakeholders
- c) Demonstrate how the Control Cycle can be applied in a variety of practical commercial situations

### **2. Relate the Main Features within the General Environment to Medium and Long-Term Commercial Decisions**

- a) Interpret how the present economic conditions and the social, demographic, and economic trends within a community can affect medium and long-term commercial decisions
- b) Discuss the impact of technological changes on the economic environment

### **3. Analyse the Main Features and Risks of the Financial Services Marketplace Including Products and Distribution Channels**

- a) Discuss the needs of consumers that are met by financial products and the major considerations which providers need to assess to meet these objectives
- b) Identify the main features and objectives of consumer protection requirements and relate these to the responsibilities of both consumers and providers
- c) Identify the main features of commonly available financial services and risk based products, and differentiate the advantages and disadvantages, including the financial, business and political risks, of each contract to the provider and the consumer
- d) Distinguish the main forms of distribution for financial services products, and interpret the impact of varying distribution channels on the development and management of products
- e) Identify the range of marketing strategies available to financial services institutions, and discuss the effect that alternative marketing strategies may have on the quality and quantity of business generated
- f) Identify and discuss how these concepts apply to products and contracts other than financial services

### **4. Examine the Need for, and Impact of, Regulation and Government Policy on Medium and Long-Term Commercial Decisions**

- a) Identify and examine the roles and objectives of regulators and of Government policymakers
- b) Examine the implications of the main features of legislation and the regulatory taxation framework which affect medium and long-term commercial decisions
- c) Explain the statutory roles of actuaries and other independent professionals, and their interactions

## **5. Recognise the Importance of Capital**

- a) Discuss the importance of capital for different types of entities
- b) Recognise the ongoing need for capital, and how to project future levels of capital
- c) Identify risks to the level of capital and apply risk based capital methodologies
- d) Demonstrate an understanding of the interaction between the management of risk and capital requirements

## **6. Understand and Apply an Enterprise Risk Management Framework to Identify and Assess the Risks in a Range of Situations**

- a) Define Enterprise Risk Management (ERM) and describe how an organisation's culture impacts its approach to ERM
- b) Discuss the importance of having a risk management framework that is understood by all within the organisation
- c) Explain how ERM is managed at all levels within an organisation
- d) Outline how to determine the level of risk that is acceptable/optimal for a business
- e) Demonstrate an understanding of the tradeoff between risk and reward
- f) Use various analyses to identify the risks that count to an organisation
- g) Apply the actuarial control cycle to enterprise risk
- h) Relate the concept of financial risk evaluation to a range of financial products, with particular reference to assets in isolation (eg derivatives), liabilities in isolation (eg reinsurance) and asset-liability management, from the point of view of the provider and the consumer
- i) Demonstrate an understanding of the considerations which need to be taken into account in the decision of accepting, transferring or rejecting risk, including the availability of capital
- j) Examine the importance of quality data in the assessment of risks, and identify checks that could be used
- k) Explain the major risks faced by the long-term insurer, identify factors that are likely to affect their future experience and how they may be handled
- l) Examine the effect of variations in the major areas of risk and uncertainty faced by general insurers, and how they may be handled
- m) Describe the operation of the main types of reinsurance
- n) Explain the major risks faced by employers and members of defined benefit and defined contribution superannuation plans, and how they may be handled
- o) Demonstrate an understanding of the impact of guarantees and options on the risks faced by providers, and how they may be handled
- p) Identify the principles of project management, including verification of client needs and ongoing communication

## **7. Select and Build an Appropriate Model to Solve Client Problems**

- a) Identify the objectives of building a model for the management of risk based and other financial products, from the perspective of users and other stakeholders
- b) Describe the basic features of commonly used models, and discuss their limitations in terms of achieving the objectives of the modelling exercise
- c) Critically examine the data available for constructing a model, and identify shortcomings
- d) Identify the parameters required for a model, and the assumptions inherent in the model
- e) Examine the interrelationships between the parameters and assumptions within the model, and the way in which the model objectives affect the choice of these parameters and assumptions

- f) Explain the need for assessing the sensitivity of the results to changes in the major assumptions, and demonstrate an understanding of how the results from models are influenced by its assumptions
- g) Discuss the strengths and weaknesses of stochastic and deterministic models, and identify situations to which each may be well-suited
- h) Analyse the choice of a model for use in solving particular problems in a range of areas
- i) Demonstrate an ability to build a model appropriate for a typical financial services business problem

### **8. Discuss and Apply the Process of Product Design**

- a) Outline and relate the factors to consider in determining a suitable design for a range of financial products, including new contracts for life insurance, general insurance and the design of superannuation plans, from perspectives of the major stakeholders
- b) Examine the interaction between the different disciplines in a product development process, including finance, sales and marketing, and compliance
- c) Outline the protections available to consumers of financial products, including insurance and wealth creation products
- d) Describe the purpose and process of risk assessment (underwriting), the impact of adverse selection, and examine its role in financial product design
- e) Explain the concept of Policyholder Reasonable Expectations and how these can be managed
- f) Examine particular issues which need to be taken into consideration in the design of group financial products, in contrast to individual financial products
- g) Demonstrate an understanding of the interests of various stakeholders, and the ability to communicate and verify this understanding

### **9. Apply the Tests of Professionalism**

- a) Identify the principles of professionalism and relate them to the actuarial profession
- b) Outline the main features and functions of the professional association, its code of conduct, professional standards and major guidance notes
- c) Discuss the responsibilities of actuaries individually and in statutory roles
- d) Demonstrate an understanding of the need for, and application of, materiality and peer review
- e) Identify situations where actuarial expertise may be insufficient, and analyse what consequent actions might then be appropriate