ACST4031
Actuarial Control Cycle A1

Course Description
The aim of the Actuarial Control Cycle is to provide students with an understanding of underlying actuarial principles that may be applied to a range of problems and issues in commercial and business environments. Students are expected to develop a holistic approach to practical problem solving, and develop a level of judgement and professional skills required to successfully apply actuarial principles. The syllabus relates to actuarial practice both in the financial services and in other industries. Examples will be drawn from traditional and non-traditional areas to illustrate and establish the underlying actuarial principles in a problem based learning approach, using case studies and business-based examples.

This subject, in conjunction with ACST4032 and ACST4033, provides the opportunity for exemption from the Part II academic requirements of the Actuaries Institute. Such exemption depends on the grades attained over all three subjects.

<table>
<thead>
<tr>
<th>Semester and Year</th>
<th>S1 2015</th>
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<tbody>
<tr>
<td>Mode of Delivery</td>
<td>On campus</td>
</tr>
<tr>
<td>Course URL</td>
<td><a href="http://programsandcourses.anu.edu.au/course/ACST4031">http://programsandcourses.anu.edu.au/course/ACST4031</a></td>
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<tr>
<td>Prerequisites</td>
<td>STAT3038/6045</td>
</tr>
<tr>
<td>Course Convener</td>
<td>Aaron Bruhn</td>
</tr>
<tr>
<td>Office Location</td>
<td>Room 4.45, CBE Building</td>
</tr>
<tr>
<td>Phone</td>
<td>02 6125 4904</td>
</tr>
<tr>
<td>Email</td>
<td><a href="mailto:Aaron.bruhn@anu.edu.au">Aaron.bruhn@anu.edu.au</a></td>
</tr>
<tr>
<td>Consultation hours</td>
<td>To be advised</td>
</tr>
<tr>
<td>Bio and research interests</td>
<td>Prior to coming to ANU, Aaron worked as an actuary in Life Insurance and then as a Principal Economic and Financial Advise in the public service. He is interested in a range of areas of actuarial science, including life insurance, mortality and morbidity modelling, superannuation, and also a number of non-traditional fields.</td>
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</table>
| Student Administrators | Anna Pickering  
Room 4.48, CBE Building  
Phone: 6125 9045  
Email: anna.pickering@anu.edu.au |
COURSE OVERVIEW

Course Learning Outcomes
Upon successful completion of the requirements of this course, the student will be able to:

• Discuss and apply an actuarial control cycle in a variety of practical commercial situations
• Relate the main features within the general environment to medium and long-term commercial decisions
• Analyse the main features of the financial services marketplace including products and distribution channels
• Examine the need for, and impact of, regulation and government policy on medium and long-term commercial decisions
• Recognise the importance of capital
• Understand and apply an enterprise risk management framework to identify and assess the risks in a range of situations
• Select and build an appropriate model to solve client problems
• Discuss and apply the process of product design
• Apply the tests of professionalism

The full, detailed syllabus for this component of the Part II course is included at the end of this document as part of an overview of the entire Part II program.

Research-Led Teaching
This course covers the relevant parts of the Actuaries Institute Part II syllabus. It will be informed by practical examples and case studies of relevance to professional and research issues currently faced by the profession.

There will also be several guest speakers throughout the course. These speakers have many years of experience and professional practice and their presentations will address key aspects of part II learning outcomes.

Continuous Improvement
We use feedback from students, professional bodies and staff to make regular improvements to the course. In response to this feedback, design improvements from the previous version of the course include:

• Student feedback in course evaluations
• Review of assessment materials from other academic staff
• Insights and suggestions from guest presenters

Technology, Software, Equipment
In later weeks of this course (weeks 9 to 11), we will be using excel spreadsheets in class to demonstrate features of modelling. This will require you to work on these spreadsheets in class, so bringing your own laptop to those classes is essential. This spreadsheet work also serves as preparation for some parts of the final exam, which will be held in computer labs and will involve some questions being based on spreadsheet work. If you do not have access to a laptop for those classes, please see the course convenor (Aaron) as soon as possible.
Student Feedback
All CBE courses are evaluated using Student Experience of Learning and Teaching (SELT) surveys, administered by Planning and Statistical Services at the ANU. These surveys are offered online, and students will be notified via email to their ANU address when surveys are available in each course. Feedback is used for course development so please take the time to respond thoughtfully. Course feedback is anonymous and provides the Colleges, University Education Committee and Academic Board with opportunities to recognise excellent teaching and to improve courses across the university. For more information on student surveys at ANU and reports on feedback provided on ANU courses, visit http://unistats.anu.edu.au/surveys/selt/students/ and http://unistats.anu.edu.au/surveys/selt/results/learning/

COURSE SCHEDULE

<table>
<thead>
<tr>
<th>Week (start date)</th>
<th>Summary of Activities</th>
<th>Assessment</th>
<th>Reading from textbook</th>
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</thead>
<tbody>
<tr>
<td>1 (16 Feb)</td>
<td>The Control Cycle; General Environment</td>
<td></td>
<td>Chapters 1 &amp; 5</td>
</tr>
<tr>
<td>2 (23 Feb)</td>
<td>General Environment; Financial Services Marketplace</td>
<td></td>
<td>Chapter 4</td>
</tr>
<tr>
<td>3 (2 March)</td>
<td>Financial Services Marketplace</td>
<td></td>
<td></td>
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<tr>
<td>4 (9 March)</td>
<td>Financial Services Marketplace</td>
<td>Assignment 1 due Friday 13 March</td>
<td></td>
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<tr>
<td>5 (16 March)</td>
<td>Regulation</td>
<td>Assignment 2 due Tuesday 17 March</td>
<td>Chapter 7</td>
</tr>
<tr>
<td>6 (23 March)</td>
<td>Regulation / Capital</td>
<td>Assignment 3 due Tuesday 24 March</td>
<td>Chapter 11</td>
</tr>
<tr>
<td>7 (30 March)</td>
<td>Capital</td>
<td>Assignment 4 due Tuesday 31 March</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Mid semester break</td>
<td></td>
</tr>
<tr>
<td>8 (20 April)</td>
<td>Enterprise Risk Management</td>
<td></td>
<td>Chapters 2 &amp; 6</td>
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<tr>
<td>9 (27 April)</td>
<td>Modelling</td>
<td>Mid semester exam</td>
<td>Chapter 9</td>
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<tr>
<td>10 (4 May)</td>
<td>Modelling</td>
<td></td>
<td></td>
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<tr>
<td>11 (11 May)</td>
<td>Modelling; Product design</td>
<td></td>
<td>Chapter 8</td>
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<tr>
<td>12 (18 May)</td>
<td>Product design</td>
<td>Assignment 5 due Tuesday 19 May</td>
<td></td>
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<tr>
<td>13 (25 May)</td>
<td>Professionalism; Revision</td>
<td></td>
<td>Chapter 3</td>
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COURSE ASSESSMENT

Assessment Summary

<table>
<thead>
<tr>
<th>Assessment Task</th>
<th>Value</th>
<th>Due Date</th>
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<tbody>
<tr>
<td>1. Assignment 1</td>
<td>3%</td>
<td>Friday 13 March</td>
</tr>
<tr>
<td>2. Assignments 2/3/4</td>
<td>Best 2 of the 3 assignments count for 1% each; to give a total value of 2%</td>
<td>Assignment 2 due Tuesday 17 March; Assignment 3 due Tuesday 24 March; Assignment 4 due Tuesday 31 March</td>
</tr>
<tr>
<td>3. Mid semester exam (redeemable)</td>
<td>15%</td>
<td>In week 9 of semester. Specific date to be advised.</td>
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<tr>
<td>4. Assignment 5</td>
<td>10%</td>
<td>Tuesday 19 May</td>
</tr>
<tr>
<td>5. Final Exam</td>
<td>70%</td>
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There will be no special examinations for the mid-semester exam. If you do not sit the mid-semester exam, the weighting will be moved to the final exam. This means that your final raw grade will be the greater of:

15% from \{assignments\} + 15% from \{mid semester exam\} + 70% from \{final exam\};

or

15% from \{assignments\} + 85% from \{final exam\}.

Assessment Tasks: Assignments

Assignment 1, worth 3% of your final raw grade, will be available on Wattle from Tuesday 3 March. It will be due by 2pm on Friday 13 March.

Assignments 2, 3 and 4 will each consist of a small task to be completed regarding an issue or learning point that has been raised in a lecture. The best 2 of these 3 assignments count for 1% each, to give a total contribution to the overall raw grade of 2%:

- Assignment 2 will be available on Wattle from Friday 13 March and will be due by 2pm on Tuesday 17 March;
- Assignment 3 will be available on Wattle from Friday 20 March and will be due by 2pm on Tuesday 24 March;
- Assignment 2 will be available on Wattle from Friday 27 March and will be due by 2pm on Tuesday 31 March.

Assignment 5, worth 10% of your final raw grade, will be available on Wattle from Friday 8 May. It will be due by 2pm on Tuesday 19 May.

Assignment submission

All assignments must be submitted to the School Office on level 4 of the CBE building and must include a cover sheet. Email and fax submissions are not acceptable. You must keep a copy of assessment materials submitted for your records.

All work must be submitted by the due date and time. Anything that is submitted after the relevant date and time will receive a mark of 0%.

Marked assignments and the essay will be returned as soon as they are marked, at the next available lecture time, or you will be able to collect them from the course convenor.
Examinations
The mid-semester exam will be 1 hour in length, plus 10 minutes of reading time.

The final exam will be 3 hours long plus an additional 15 minutes as reading time.

For both exams, you will be permitted to bring in a calculator, an English dictionary if required, the Course Textbook, plus 2 A4 sheets of paper with your own notes written on them.

Further details relating to these exams will be provided closer to the time of each respective examination.

Scaling
Your final mark for the course will be based on the raw marks allocated for each assignment or examination. However, your final mark may not be the same number as produced by that formula, as marks may be scaled. Any scaling applied will preserve the rank order of raw marks (i.e. if your raw mark exceeds that of another student, then your scaled mark will exceed or equal the scaled mark of that student), and may be either up or down.

Referencing Requirements
Accepted academic practice for referencing sources that you use in assignments can be found via the links on the Wattle site, under the file named “ANU and College Policies, Program Information, Student Support Services and Assessment”. For a more interactive guide on what this is all about, please see http://library.acadiau.ca/tutorials/plagiarism/.

READING LISTS
The required textbook for this course is ‘Understanding Actuarial Management: the actuarial control cycle’, second edition (2010), issued by the Institute of Actuaries of Australia and the Society of Actuaries.

This textbook is available from the University Co-op bookstore, or directly from the Actuaries Institute at http://www.actuaries.asn.au/knowledge-bank/book-shop.

Other reading and reference material will be made available on Wattle throughout the semester.

COMMUNICATION
Students are expected to check the Wattle site for announcements about this course, e.g. changes to timetables or notifications of cancellations. These will typically be made through the News Forum on Wattle, to which all students are automatically subscribed. Notifications of emergency cancellations of classes will be posted on the door of the relevant room.

Any personal queries regarding the course should generally be made by emailing the course convenor.

Email
If necessary, the course convenor will contact students on their official ANU student email address. Information about your enrolment and fees from the Registrar and Student Services’ office will also be sent to this 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 of the relevant room.

Course URLs
More information about this course may be found on:

- Programs and Courses (http://programsandcourses.anu.edu.au/2015/Catalogue)
- the College of Business and Economics website (http://cbe.anu.edu/courses) and
- Wattle (https://wattle.anu.edu.au), the University's online learning environment. Log on to Wattle using your student number and your ISIS password.

POLICIES
The University offers a number of support services for students. Information on these is available online from http://students.anu.edu.au/studentlife/

ANU has educational policies, procedures and guidelines, which are designed to ensure that staff and students are aware of the University’s academic standards, and implement them. You can find the University’s education policies and an explanatory glossary at: http://policies.anu.edu.au/

Students are expected to have read the Student Academic Integrity Policy before the commencement of their course.

Other key policies include:

- Student Assessment (Coursework)
- Student Surveys and Evaluations

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 ACST4031, ACST4032 and ACST4033, with a minimum requirement of 60% in each unit.

The weights will be

ACST4031 33.3%
ACST4032 33.3%
ACST4033 33.3%
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:
- ACST4031/ACST8040 offered in First Semester and
- ACST4032/ACST8041 offered in Second Semester.
- Investment and Asset Modelling is offered as ACST4033/ACST8033 in Second Semester.

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 ACST4031/ACST8040, ACST4032/ACST8041 and ACST4032/ACST8033, with a minimum requirement of 60% in each unit.

Each unit has equal weight (33.3%).

Each course has its own Outline which contains the necessary detailed information for the respective course. This document gives an overview of the whole Part II requirements.
ACST4031/ACST8040

1. Discuss and apply an actuarial control cycle in a variety of practical commercial situations
2. Relate the main features within the general environment to medium and long-term commercial decisions
3. Analyse the main features of the financial services marketplace including products and distribution channels
4. Examine the need for, and impact of, regulation and government policy on medium and long-term commercial decisions
5. Recognise the importance of capital
6. Understand and apply an enterprise risk management framework to identify and assess the risks in a range of situations
7. Select and build an appropriate model to solve client problems
8. Discuss and apply the process of product design
9. Apply the tests of professionalism

ACST4032/ACST8041

10. Monitor and assess experience
11. Determine an appropriate assumption set
12. Apply relevant approaches and techniques to the valuation of liabilities
13. Measure, report and manage solvency
14. Understand the methods and implications of various approaches to profit measurement
15. Understand the calculation of appraisal values
16. Apply appropriate techniques to the pricing of products and contracts
17. Manage the business and respond to the experience

ACST4033/ACST8033

1. Demonstrate an understanding of the characteristics, returns and risk factors of the different types of investment
2. Apply the methods used for the valuation of investments
3. Develop an understanding of the major economic, financial and practical theories relevant to investment
4. Understand the impact of the liabilities on investment objectives and constraints
5. Describe the characteristics and limitations of the major stochastic investment models
6. Derive relevant assumptions for each of these models
7. Demonstrate the ability to build a relevant stochastic investment model
8. Formulate an appropriate investment strategy for a given liability portfolio
9. Discuss the practical implementation of investment strategy

The full, detailed syllabi for the whole Part II course follows.
Detailed Syllabi

PART IIA - Actuarial Control Cycle - Syllabus

ACST4031/ACST8040

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
10. Monitor and Assess Experience
   a) Identify the need for experience to be monitored, and the critical elements of experience relevant to particular products or entities
   b) Identify appropriate measures of experience
   c) Undertake an experience analysis
   d) Examine the practical issues involved, including data difficulties
   e) Explain the need for analysis of the financial impact of experience and its place in the Control Cycle
   f) Identify the items of such analysis relevant to particular products or entities
   g) Undertake an analysis of the financial impact of experience in a simplified situation
   h) Examine the practical issues involved, including the use of approximations
   i) Explain how returns on asset portfolios should be monitored and assessed, including the appropriate usage of the different methods of calculating returns, performance attribution to asset classes and security selection, and analysis of risk
   j) Demonstrate how to monitor the ongoing validity of the strategic asset allocation adopted in light of experience
   k) Discuss and apply criteria by which the success of the investment decision can be assessed over time, and identify how the asset liability monitoring process can be used to benefit the investment decision process

11. Determine an Appropriate Assumption Set
   a) For each assumption used in the modelling process, specify the information required, explain its relevance, examine problems that may arise in obtaining the required information, including difficulties with data, and explain how these issues may be addressed in determining the appropriate assumption
   b) Recognise the issues arising when assumptions are determined on a regular cycle rather than at a single point
   c) Demonstrate an understanding of the need for internal consistency between the individual assumptions in an assumption set
   d) Determine an appropriate assumption set in a variety of practical situations

12. Apply Relevant Approaches and Techniques to the Valuation of Liabilities
   a) Compare and contrast the different purposes for which a valuation of liabilities may be needed
   b) Relate data requirements, specification, verification, correction and materiality to the purpose of the valuation of liabilities
   c) Discuss and apply the major criteria in the selection of discount factors
   d) Explain the need for assessing sensitivities and reasonableness of the valuations, identifying the major drivers of change, both at a point in time and over time, and how these may be communicated
   e) Examine the issues in spreading the cost for commitments, such as defined benefit superannuation, where costs are being met over a period, and describe, in broad terms, the techniques used
   f) Explain how guarantees and other options for long-term products can be incorporated in the valuation of liabilities
   g) Apply the valuation of liabilities in a variety of practical situations
13. Measure, Report and Manage Solvency
   a) Compare and contrast the different purposes for which a comprehensive valuation of liabilities and assets may be needed, including the various purposes for which these values might be reported
   b) Recognise alternative measures of solvency with reference to assets and liabilities
   c) Describe the different approaches to dealing with uncertainty in measuring liabilities and assets, including the difficulties of placing a value on risk
   d) Understand the approaches adopted by APRA in respect to solvency of the institutions whom they regulate
   e) Discuss the interaction between solvency, best estimates of liabilities, prudential margins and release of profit
   f) Discuss how consumers can be protected from the effects of insolvency, including the role of regulators, professions and guarantee schemes
   g) Identify the issues involved in dealing with insolvency/"winding-up"
   h) Communicate valuation methodology and results to stakeholders

14. Understand the Methods and Implications of Various Approaches to Profit Measurement
   a) Discuss the different approaches which are used to measure profit
   b) Relate the interaction between the valuation process and the timing of release of profit
   c) Describe, in broad terms, techniques used to manage the release of profit on ongoing contracts
   d) Communicate the results to stakeholders

15. Understand the Calculation of Appraisal Values
   a) Calculate embedded value and appraisal values
   b) Discuss the uses of these measures of profitability and value

16. Apply Appropriate Techniques to the Pricing of Products and Contracts
   a) Discuss the general objectives of pricing for each stakeholder, and examine the interrelationship of their particular needs and requirements
   b) Describe and apply processes for setting margins (either implicit or explicit) which may be used in the pricing process
   c) Describe the role of profit testing and its relationship with the desired return on capital invested
   d) Apply the pricing process in a variety of practical situations

17. Manage the Business and Respond to the Experience
   a) Discuss how changes in experience impact on the management of businesses
   b) Outline ways of responding to the experience, other than distribution of surplus
   c) Explain the issues of distribution of surplus, including equity, solvency and practicality
   d) Apply methodologies for allocating investment return to individual accounts, for both unitised and non-unitised products, and discuss the issues which arise in practice
   e) Discuss appropriate ways of allocating profit for an insurer and achieving equity between different groups of policyholders and shareholders
   f) Examine the methods available to handle surpluses or deficits within superannuation plans and achieving equity between groups of members
   g) Discuss management processes such as claims control, expenses control, financial control systems and audit controls
PART IIB - Actuarial Control Cycle - Syllabus

ACST4033/ACST8033

1. Demonstrate an Understanding of the Characteristics, Returns and Risk Factors of the Different Types of Investment
   a) Explain the characteristics of each of the different types of investment
   b) Explain the returns expected of different investment types under different economic conditions
   c) Demonstrate an understanding of the risk factors, including issuer default, counterparty failure, systemic liquidity, the collapse of speculative bubbles, shocks to the system and cyclical/structural changes for each type of investment

2. Apply the Methods Used for the Valuation of Investments
   a) Describe the principles, implicit assumptions and limitations of the main methods used to value the common forms of debt, equity, property and derivative securities
   b) Determine the data required to perform a valuation of each type of investment

3. Develop an Understanding of the Major Economic, Financial and Practical Theories Relevant to Investment
   a) Develop an understanding of the application and limitations of the major economic, financial and practical theories relevant to investment
      a. the efficient market hypothesis,
      b. the capital asset pricing model,
      c. multi-factor pricing models,
      d. fundamental analysis
      e. “charting”
      f. theories from behavioural finance
      g. fractal finance
   b) Critically evaluate each of these theories and discuss the evidence for and against the validity of each one

4. Understand the Impact of the Liabilities on Investment Objectives and Constraints
   a) Describe the needs of different investors in terms of the role of liabilities, the attitude to risk, liquidity requirements and any gearing restrictions, taxation and regulatory constraints that should be taken into account in establishing an investment strategy
   b) Determine investment objectives and material constraints based on the nature of the liabilities

5. Describe the Characteristics and Limitations of the Major Stochastic Investment Models
   a) Describe the characteristics of each of the major stochastic investment models
   b) Understand the differences in structure and implicit assumptions between each of the models
   c) Critically evaluate the suitability of each model for a given context
   d) Understand the “success” of each model’s past predictions against the actual outcomes

6. Derive Relevant Parameters for each of these Models
   a) Demonstrate the ability to select the appropriate data
   b) Derive parameters from this data which is consistent with the structure, characteristics and implicit assumptions of each model

7. Demonstrate the Ability to Build a Relevant Stochastic Investment Model
   a) Select a stochastic investment model appropriate to a particular situation
b) Determine the parameters for the selected model given the particular situation
c) Build and apply the model

8. **Formulate an Appropriate Investment Strategy for a Given Liability Portfolio**
   a) Demonstrate the ability to optimise asset/liability matching to achieve the best match of durations, investment returns and volatility constraints
   b) Manage the relationship between this optimisation and the availability of capital and other constraints
   c) Formulate a strategic asset allocation, including using an asset liability model where appropriate
   d) Examine the imperfections and compromises of the model and the process

9. **Discuss the Practical Implementation of Investment Strategy**
   a) Discuss the practical implementation of investment strategy, including manager selection, the roles of major stakeholders (fund managers, custodians, etc), performance measurement, manager replacement in the process.
   b) Determine the relevant constraints on manager freedom