

Part II 2011 Syllabus:

Part II 2011 is comprised of Part IIA The Actuarial Control Cycle and Part IIB Investments and Asset Modelling.

Part IIA – The Actuarial Control Cycle

The aim of the Actuarial Control Cycle (Part II) 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. The Actuarial Control Cycle forms a 'bridge' between Part I, where students learn specific technical skills in a well-defined environment, and Part III, where students are taught to apply these skills

in less well defined business and commercial environments. During Part II 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. While the area of 'professionalism' is outlined in Aim 2 of the syllabus, it is expected that there would be ongoing reference to professionalism throughout the course.

The Actuarial Control Cycle demonstrates an holistic approach to understanding actuarial practice and principles; and as such it is not taught specifically by practice area. The syllabus relates to actuarial practice both in the financial services and in other industries, and as such is deliberately presented in general terms to highlight its application beyond financial services. In each Aim, it is expected that examples will be drawn from traditional and non-traditional areas to illustrate and establish the underlying actuarial principles, although financial services applications would represent a large proportion of the examples.

The recommended approach to presentation of the Actuarial Control Cycle is that it be a problem based learning approach. The use of case studies and business-based examples is therefore required. The intention is for the Actuarial Control Cycle to be taught over two semesters.

The Actuarial Control Cycle course enables candidates to:

1. Discuss and Apply an Actuarial Control Cycle in a Variety of Practical Commercial Situations
2. Apply the Tests of Professionalism
3. Relate the Main Features within the General Environment to Medium and Long Term Commercial Decisions
4. Examine the Need for and Impact of Regulation and Government Policy on Medium and Long Term Commercial Decisions
5. Analyse the Main Features and Risks of Financial Products and Contracts, from the Point of View of Consumers and Providers
6. *Demonstrate an Understanding of Enterprise Risk Management and its Role in Organisational Management*
7. Apply a Risk Assessment Framework to Identify and Assess the Risks in a Range of Commercial Situations
8. Discuss and Apply the Process of Product Design
9. Select an Appropriate Model to Solve Client Problems
10. Recognise the Importance of Capital

11. Apply Relevant Approaches and Techniques to the Valuation of Liabilities
12. Apply Appropriate Techniques to the Pricing of Products and Contracts
13. Measure, Report and Manage Solvency
14. Measure and Report Emerging Profits and/or Costs
15. Monitor and Assess Experience
16. Manage the Business and Respond to the Experience

Details of Aims and Objectives of the Actuarial Control Cycle

OVERVIEW OF APPROACH AND PROFESSIONALISM

- 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. 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

THE GENERAL ECONOMIC AND COMMERCIAL ENVIRONMENT

- 3. 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
 - c) Demonstrate an understanding of the different types of investment and investment theories
- 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. Analyse the Main Features and Risks of Financial Products and Contracts, from the Point of View of Consumers and Providers**
- 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

SPECIFYING THE PROBLEM

- 6. Demonstrate an Understanding of Enterprise Risk Management and its Role in Organisational Management**
- 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 tradeoffs 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
- 7. Apply a Risk Assessment Framework to Identify and Assess the Risks in a Range of Commercial Situations**
- a) Relate the concept of financial risk evaluation to a range of financial products, with particular reference to assets in isolation (e.g. derivatives), liabilities in isolation (e.g. reinsurance) and asset-liability management, from the point of view of the provider and the consumer
 - b) 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
 - c) Examine the importance of quality data in the assessment of risks, and identify checks that could be used

- d) 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
- e) Examine the effect of variations in the major areas of risk and uncertainty faced by general insurers, and how they may be handled
- f) Describe the operation of the main types of reinsurance
- g) Explain the major risks faced by employers and members of defined benefit and defined contribution superannuation plans, and how they may be handled
- h) Demonstrate an understanding of the impact of guarantees and options on the risks faced by providers, and how they may be handled
- i) Identify the principles of project management, including verification of client needs and ongoing communication

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
- h) 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 for a product
- i) Formulate a strategic asset allocation for a product, including using an asset liability model where appropriate

DEVELOPING THE SOLUTION

9. Select 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) Examine the role of scenario testing, including the nature of “best estimate” assumptions
- h) Discuss the strengths and weaknesses of stochastic and deterministic models, and identify situations to which each may be well-suited
- i) Analyse the choice of a model for use in solving particular problems in a range of areas

10. 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, and the special issues which apply to mutual organisations
- 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

11. 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) Explain how guarantees and other options for long-term products can be incorporated in the valuation of liabilities
- f) Apply the valuation of liabilities in a variety of practical situations

12. 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) 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
- c) Describe and apply processes for setting margins (either implicit or explicit) which may be used in the pricing process
- d) Describe the role of profit testing and its relationship with the desired return on capital invested
- e) Apply the pricing process in a variety of practical situations

MONITORING, REPORTING AND RESPONDING TO THE EXPERIENCE

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) Discuss the interaction between solvency, best estimates of liabilities, prudential margins and release of profit
- e) Discuss how consumers can be protected from the effects of insolvency, including the role of regulators, professions and guarantee schemes
- f) Identify the issues involved in dealing with insolvency/"winding-up"
- g) Communicate valuation methodology and results to stakeholders

14. Measure and Report Emerging Profits and/or Costs

- a) Relate the interaction between the valuation process and the timing of release of profit
- b) Describe, in broad terms, techniques used to manage the release of profit on ongoing contracts
- c) 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
- d) Calculate embedded value and appraisal values, and discuss the uses of these measures of profitability
- e) Communicate the results to stakeholders

15. 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) *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*
- h) *Demonstrate how to monitor the ongoing validity of the strategic asset allocation adopted in light of experience*
- i) Undertake an analysis of the financial impact of experience in a simplified situation
- j) Examine the practical issues involved, including the use of approximations

16. 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 –Investment and Asset Modeling Syllabus 2010

Unit 1: The Investment Process

Describe and critically evaluate the types of investments; their attributes in varying circumstances; valuation methods including assumptions and limitations; and the critical application of models from economics and finance to investment management.

Learning Objectives

- 1.1 Be able to describe and critically discuss the characteristics and behavior of different Investment types under different economic conditions, understanding the relationship between risk and return and recognizing risk factors which includes issuer default, counterparty failure, systemic liquidity, the collapse of speculative bubbles, shocks to the economic system and cyclical/structural changes.
- 1.2 Develop an understanding of the methods used for valuation of the common forms of debt, equity, property and derivative securities. In particular students should be aware of:
 - the valuation methods and principles
 - data requirements and sources
 - the implicit assumptions and limitations of these models
- 1.3 Develop an understanding of the application and limitations of the major economic and financial theories relevant to investment, and be able to critically evaluate these theories including:
 - the efficient market hypothesis
 - the capital asset pricing model
 - multi-factor pricing models
 - theories from behavioral finance

Unit 2: Asset Modeling

Construct, critically evaluate and apply asset models of a stochastic nature that are appropriate to the management of liabilities. The outcome of such an exercise is usually an investment strategy for managing the liabilities.

Learning Objectives

- 2.1 Define appropriate investment objectives based on the liability profile of a fund
- 2.2 Specify appropriate investment constraints, based on the liability profile of a fund
- 2.3 Identify the characteristics of different types of asset models.
- 2.4 Critically evaluate the appropriateness of an asset model for a given context
- 2.5 Derive consistent asset assumptions for asset models, taking into account historical data, prevailing industry expectations, contemporary investment literature, and other practical considerations such as tax.
- 2.6 Apply asset assumptions, and the linkages contained within asset models, to real world situations.
- 2.7 Describe and critically evaluate different approaches to asset allocation.