Actuaries Institute.

Actuary Program

Actuarial Control Cycle

Subject Syllabus 2024

1. Overview and aim

The aim of this subject 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 subject is taught in universities and will help students move from a more theoretical approach to an understanding of practical applications.

This subject demonstrates a holistic approach to understanding actuarial practice and principles.

The syllabus relates to actuarial practice primarily in the financial services and there is a substantial body of knowledge required to be assimilated. However, the underlying principles are broad and may be applied in wider fields.

2. Student outcomes

After successfully completing this subject, students will be able to:

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 and risks of financial products and contracts, from the point of view of consumers and providers
4. Demonstrate an understanding of Enterprise Risk Management
5. Apply a risk assessment framework to identify and assess the risks in a range of situations
6. Discuss and apply the process of product design
7. Understand how models are used to solve client problems
8. Recognise the Importance of capital
9. Apply relevant approaches and techniques to the valuation of liabilities
10. Apply appropriate techniques to the pricing of products and contracts
11. Understand the principles of:
    - measuring, reporting and managing solvency;
    - measuring and reporting emerging profits and/or costs;
    - monitoring and assessing experience; and
    - responding to emerging experience.

3. Prerequisites

Each university decides on the prerequisites. The Actuaries Institute recommends that students study the Foundation Program subjects before attempting the Actuarial Control Cycle.

4. Assessment skill level

Assessment of this subject will be split across the following skill levels:

- Simple Application (20%): demonstration of a detailed knowledge and understanding of the topic
- Application (50%): demonstration of an ability to apply the principles underlying the topic within a given context; and
- Higher Order (30%): demonstration of an ability to perform deeper analysis and assessment of situations, including forming judgements, considering different points of view, comparing and contrasting situations, suggesting possible solutions and actions and making recommendations.

5. Assessment method

Each university decides on the method of assessment.

6. Learning objectives

1 Discuss and apply an Actuarial Control Cycle in a variety of situations.

1.1 Identify the elements of the Control Cycle and how the elements interrelate in an actuarial context.

1.2 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.

1.3 Demonstrate how the Control Cycle can be applied in a variety of situations.

The General Economic and Commercial Environment

2 Relate the main features within the general environment to medium and long-term commercial decisions.

2.1 Interpret how economic conditions and the social, demographic, and economic trends within a community can affect medium and long-term commercial decisions.

2.2 Examine the implications of the main features of the legislative and regulatory framework which can affect medium and long term commercial decisions.

2.3 Discuss the impact of technological changes on the economic environment.

3 Analyse the main features and risks of financial products and contracts, from the point of view of consumers and providers.

3.1 Discuss the needs of consumers that are met by financial products and the major considerations which providers need to assess to meet these objectives.

3.2 Identify the main features and objectives of consumer protection requirements and relate these to the responsibilities of both consumers and providers.

3.3 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.

3.4 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.

3.5 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.

Specifying the Problem

4 Demonstrate an understanding of Enterprise Risk Management.

4.1 Define Enterprise Risk Management (ERM) and describe how an organisation's culture impacts its approach to ERM.

4.2 Discuss the importance of having a risk management framework that is understood by all within the organisation.

4.3 Explain how ERM is managed at all levels within an organisation.

4.4 Outline how to determine the level of risk that is acceptable/optimal for a business.

4.5 Demonstrate an understanding of the trade-offs between risk and reward.

4.6 Use various analyses to identify the risks that count to an organisation.

4.7 Apply the actuarial control cycle to enterprise risk.

5 Apply a risk assessment framework to identify the risks in a range of situations.

5.1 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.

5.2 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,

5.3 Examine the importance of quality data in the assessment of risks, and identify checks that could be used.

5.4 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.

5.5 Examine the effect of variations in the major areas of risk and uncertainty faced by general insurers, and how they may be handled.

5.6 Describe the operation of the main types of reinsurance.

5.7 Explain the major risks faced by employers and members of defined benefit and defined contribution superannuation plans, and how they may be handled.

5.8 Demonstrate an understanding of the impact of guarantees and options on the risks faced by providers, and how they may be handled.

5.9 Identify the principles of project management, including verification of client needs and ongoing communication.

6 Discuss and apply the process of product design.

6.1 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.

6.2 Examine the interaction between the different disciplines in a product development process, including finance, sales and marketing, and compliance.

6.3 Outline the protections available to consumers of financial products, including insurance and wealth creation products.

6.4 Describe the purpose and process of risk assessment (underwriting), the impact of adverse selection, and examine its role in financial product design.

6.5 Explain the concept of Policyholder Reasonable Expectations and how these can be managed.

6.6 Examine particular issues which need to be taken into consideration in the design of group financial products, in contrast to individual financial products.

6.7 Demonstrate an understanding of the interests of various stakeholders, and the ability to communicate and verify this understanding.

Developing the Solution

7 Understand how models are used to solve client problems

7.1 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.

7.2 Describe the basic features of commonly used models, and discuss their limitations in terms of achieving the objectives of the modelling exercise.

7.3 Critically examine the data available for constructing a model, and identify shortcomings.

7.4 Identify the parameters required for a model, and the assumptions inherent in the model.

7.5 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.

7.6 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.

7.7 Examine the role of scenario testing, including the nature of “best estimate” assumptions.

7.8 Discuss the strengths and weaknesses of stochastic and deterministic models, and identify situations to which each may be well-suited.

8 Recognise the importance of capital.

8.1 Discuss the importance of capital for different types of entities.

8.2 Recognise the ongoing need for capital, and how to project future levels of capital, and the special issues which apply to mutual organisations.

8.3 Identify risks to the level of capital and apply risk based capital methodologies.

8.4 Demonstrate an understanding of the interaction between the management of risk and capital requirements.

9 Apply relevant approaches and techniques to the valuation of liabilities.

9.1 Compare and contrast the different purposes for which a valuation of liabilities may be needed.

9.2 Relate data requirements, specification, verification, correction and materiality to the purpose of the valuation of liabilities.

9.3 Discuss and apply the major criteria in the selection of discount factors.

9.4 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.

9.5 Explain how guarantees and other options for long-term products can be incorporated in the valuation of liabilities.

9.6 Apply the valuation of liabilities in a variety of simplified situations.

10 Understand appropriate techniques to the pricing of products and contracts.

10.1 Discuss the general objectives of pricing for each stakeholder, and examine the interrelationship of their particular needs and requirements.

10.2 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.

10.3 Describe and apply processes for setting margins (either implicit or explicit) which may be used in the pricing process.

10.4 Describe the role of profit testing and its relationship with the desired return on capital invested.

10.5 Discuss the pricing process in a variety of situations.

Monitoring, Reporting and Responding to the Experience

11 Measure, report and manage solvency.

11.1 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.

11.2 Recognise alternative measures of solvency with reference to assets and liabilities.

11.3 Describe the different approaches to dealing with uncertainty in measuring liabilities and assets, including the difficulties of placing a value on risk.

11.4 Discuss the interaction between solvency, best estimates of liabilities, prudential margins and release of profit.

11.5 Discuss how consumers can be protected from the effects of insolvency, including the role of regulators, professions and guarantee schemes.

11.6 Identify the issues involved in dealing with insolvency/“winding-up”.

11.7 Communicate valuation methodology and results to stakeholders.

12 Measure and report emerging profits and/or costs.

12.1 Relate the interaction between the valuation process and the timing of release of profit.

12.2 Describe, in broad terms, techniques used to manage the release of profit on ongoing contracts.

12.3 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.

12.4 Define embedded value and appraisal values, and discuss the uses of these measures of profitability.

12.5 Communicate the results to stakeholders.

13 Monitor and assess experience.

13.1 Identify the need for experience to be monitored, and the critical elements of experience relevant to particular products or entities.

13.2 Identify appropriate measures of experience.

13.3 Undertake a simple experience analysis.

13.4 Examine the practical issues involved, including data difficulties.

13.5 Explain the need for analysis of the financial impact of experience and its place in the Control Cycle.

13.6 Identify the items of such analysis relevant to particular products or entities.

13.7 Undertake an analysis of the financial impact of experience in a simplified situation.

13.8 Examine the practical issues involved, including the use of approximations.

14 Manage the business and respond to the experience.

14.1 Discuss how changes in experience impact on the management of businesses.

14.2 Outline ways of responding to the experience, other than distribution of surplus.

14.3 Explain the issues of distribution of surplus, including equity, solvency and practicality.

14.4 Apply methodologies for allocating investment return to individual accounts, for both unitised and non-unitised products, and discuss the issues which arise in practice.

14.5 Discuss appropriate ways of allocating profit for an insurer and achieving equity between different groups of policyholders and shareholders.

14.6 Examine the methods available to handle surpluses or deficits within superannuation plans and achieving equity between groups of members.

14.7 Discuss management processes such as claims control, expenses control, financial control systems and audit controls.

About the Actuaries Institute

The Actuaries Institute is the sole professional body for actuaries in Australia. The Institute provides expert comment on public policy issues where there is uncertainty of future financial outcomes. Actuaries have a reputation for a high level of technical financial skills and integrity. They apply their risk management expertise to allocate capital efficiently, identify and mitigate emerging risks and to help maintain system integrity across multiple segments of the financial and other sectors. This expertise enables the profession to comment on a wide range of issues including life insurance, health insurance, general insurance, climate change, retirement income policy, enterprise risk and prudential regulation, finance and investment and health financing.

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