

## **2. Proposals**

### **2.1 Core Technical subjects 1, 3-6 and 8**

#### **Syllabus content**

The proposed changes to the syllabus include replacing the existing six subjects with three new subjects but with the same total amount of content:

**S1 – Statistical theory and applications:** Roughly equivalent to CT3, CT4 and some of CT6, the aim of the Statistics subject is to provide a grounding in the aspects of statistics and in particular statistical modelling that are of relevance to actuarial work.

**M1 – Modelling 1:** Roughly equivalent to CT1 and CT5, the aim of the Modelling 1 subject is to provide a grounding in the principles of modelling as applied to actuarial work – focusing particularly on deterministic models.

**M2 – Modelling 2:** Roughly equivalent to CT8 and parts of CT6, the aim of the Modelling 2 subject is to provide a grounding in the principles of modelling as applied to actuarial work – focusing particularly on stochastic models.

#### **Assessment**

Each of the three new subjects would be examined by two, three-hour assessments. These would consist of one theory and one practical examination. The theory papers would be a written exam similar to those currently used. These exams would cover the whole syllabus.

The practical papers would require students to perform statistical analyses and to estimate actuarial quantities and model parameters using Excel and a statistical package, likely to be R. The M1 and M2 practical examinations would use Excel, and the S1 practical examination would use a statistical package, likely to be R.

### **2.2 Core Technical subjects 2, 7 and 9 (Business Management)**

#### **2.2.1 Syllabus content**

Proposed change to Core Technical subjects 2 and 7 are minimal, with more significant changes proposed to the Core Technical 9 syllabus.

The proposed changes to the CT2, Financial and Financial Reporting, syllabus include the additional of management accounting (including evaluation of working capital) and raising finance outside the regular banking system. In addition some expansion on topics such as regulation, maximisation of shareholder wealth, project evaluation and alternative formats of financial reporting have been proposed. Topics such as principal terms, central banks (investment exchanges and investment banks) and roles of other key financial institutions will be moved to an alternative syllabus.

The proposed changes to the CT7, Economics syllabus include the addition of material on different macroeconomics models in the wake of the Global Financial Crisis; central banks, investment exchanges and investment banks (from CT2) and the use of indifference curves. In addition some expansion on topics such as monetary union, behavioural economics and the role, structure and stability of financial systems have been proposed. It has been proposed that some material on marketing strategy be removed.

The most significant change will be to the CT9 syllabus, which will be titled 'An introduction to Business and Management'. Core syllabus topics will include Business Strategy, Organisational Behaviour, Managing Change and Leading Teams and Organisations.

#### **2.2.2 Assessment**

The assessments for these topics include; changing the CT9 assessment to a written case study exam. The basis for assessment will consist of three 1.5-2hr computer-based (or computer-assisted) exams followed by a 3-hr case study taken separately, 10-15% of which will include responding to an ethical dilemma. We would welcome comments on other suitable assessment methods for these subjects.

## **2.3 Core Application 1 (Actuarial Risk Management)**

### **2.3.1 Syllabus content**

Changes to the syllabus include moving some topics regarding how to do a professional job (including contributing to business needs, statutory roles, and professional framework) and all project management objectives to the Business and Management Technical modules. Items that are already covered in ST2 and ST4, mainly stochastic deflators, stochastic discount methods and insolvency and closure would be deleted.

### **2.3.2 Assessment**

The assessment for this subject will remain two, three-hour papers. The first will concentrate on application using mostly short answer, written questions, which will be more focused on case studies than book work. The second paper will be case-study based and consist of one hour reading/preparation time and two hour writing time, the content of which could be drawn from any part of the syllabus. Both papers would need to be passed together.

## **2.4 Core Application 2 (Modelling Documentation, Analysis and Reporting)**

The content and assessment of CA2 would remain broadly unchanged, but content would include more data analytics topics and concentration on analysis and audit trails. There would be a closer link to the Core Technical subjects which will cover the technical model design.

## **2.5 Core Application 3 (Communications)**

The IFoA is currently in the process of reviewing the content and assessment methods of CA3, the communications module. Although suggestions have been received for both short and long-term improvement, the IFoA is interested in receiving feedback on how you think communication would be best assessed within our exam structure.

Current proposals include assessing some elements of communications within the work-based skills framework and removing the requirement for an oral presentation based on relevance in the workplace.

We welcome your feedback on this subject.

## **2.6 Work-based skills**

The proposal is aimed at making the WBS requirement an integral part of our students' ongoing learning experience, rather than an unwelcome series of essays to be written before transferring to full member status.

The suggestion is to rename the requirement as Personal and Professional Development. The new system would have four Objectives, subdivided into a number of Key Competencies. Each key competency would carry a credit value, ranging from 10-25. The credit values would be weighted in favour of the most critical aspects of professional development. Some of the competencies, such as those concerning professional judgement and communications, would be mandatory. There would be different minimum numbers of credits required for CAA, Associate and Fellow.

Students would be expected to record their activities online, in a similar way to recording CPD, and there would be annual spot checks applied randomly, again using a similar system to that used for the CPD scheme. The random checks would be intended both to create self-policing behaviour and to allow us to discover non-compliance and raise it with the students at an early stage and apply appropriate sanctions. Those students not in work would be able to complete an appropriate declaration.

## **2.7 Specialist Technical and Application subjects**

Besides updating the syllabus to reflect the current market, the Specialist Technical and Specialist Application subjects will remain relatively unchanged. Most changes proposed have been in the Finance and Investment subjects. These proposals include:

1. Revise ST5 and ST6 and rename them as 'ST5 Finance and Investment' and 'ST6 Financial Derivatives'. This would include enhancing ST6 so as to focus on the practical issues associated with derivative trading and usage, whilst retaining the majority of content of ST5, but with greater signposting and regular updating.
2. A single Investment specialist application paper covering material from both ST5 and ST6. This paper may need a choice of questions for candidates.
3. Addition of a specialist subject in banking which would be 'ST10 Banking'.

4. Making the SA subjects less UK centric by including more comparative material where UK practice differs significantly from practice elsewhere.

## **Appendix A — High-level syllabus content**

### **Core Technical subjects 1, 3-6 and 8**

#### **S1 – Statistical Theory and Applications**

The aim of the Statistics subject is to provide a grounding in the aspects of statistics and in particular statistical modelling that are of relevance to actuarial work.

1. Random variables & distributions (12.5%)
2. Data analysis (10%)
3. Statistical inference (12.5%)
4. Regression theory (10%)
5. Time series (10%)
6. Stochastic processes (12.5%)
7. Bayesian statistics (10%)
8. Survival models (12.5%)
9. Machine learning (10%)

#### **M1 – Modelling 1**

The aim of the Modelling 1 subject is to provide a grounding in the principles of modelling as applied to actuarial work – focusing particularly on deterministic models.

1. Principles of modelling (10%)
2. Theory of interest rates (10%)
3. Time value of money (20%)
4. Single decrement models (20%)
5. Multiple decrement and multiple life models (20%)
6. Pricing and reserving (20%)

#### **M2 – Modelling 2**

The aim of the Modelling 2 subject is to provide a grounding in the principles of modelling as applied to actuarial work – focusing particularly on stochastic models.

1. Theories of financial market behaviour (20%)
2. Measures of investment risk (20%)
3. Asset valuation (20%)
4. Liability valuation (20%)
5. Option theory (20%)

### **2.2 Core Technical subjects 2, 7 and 9 (Business Management)**

#### **CT2 – Finance and Financial Reporting**

The aim of CT2 is to provide a basic understanding of corporate finance including a knowledge of the instruments used by companies to raise finance and manage financial risk and to provide the ability to interpret the accounts and financial statements of companies and financial institutions.

1. Corporate governance and organisation (15%)
2. How corporates are financed (15%)
3. Evaluating projects (20%)
4. Constructing and interpreting company accounts (40%)
5. Constructing management information and evaluating working capital (10%)

#### **CT7 – Economics**

The aim CT7 is to introduce students to the core economic principles and how these can be used in a business environment to help decision making and behaviour. It provides the fundamental concepts of microeconomics that explain how individuals make decisions and how these decisions interact. It explores the principles underlying macroeconomics that explain how the economic system works, where it fails and how decisions taken by individuals and governments affect the economic system.

1. Economic models and recent historical applications (10%)
2. Microeconomics (45%)

- 2.1. Behaviour of consumers
- 2.2. Behaviour of firms
- 2.3. Behaviour of markets
- 3. Macroeconomics (45%)
  - 3.1. Relationships between governments, markets and firms
  - 3.2. Government policies
  - 3.3. International trade

### **CT9 – Introduction to Business Management**

On successful completion of this subject, a student will be able to:

- 1. Apply the strategic tools and frameworks needed to assess the competitiveness of a business;
- 2. Develop a coherent business strategy;
- 3. Define a business's culture including professionalism;
- 4. Explain how a business's culture can be used to implement a chosen strategy;
- 5. Understand change management including project management;
- 6. Explain how change management skills can be applied to successfully plan and implement business change;
- 7. Understand the professional and personal qualities required to successfully lead a business.

### **CA1 – Actuarial Risk Management**

The aim of this subject is that upon successful completion, the candidate should understand strategic concepts in the management of the business activities of financial institutions and programmes, including the processes for management of the various types of risk faced, and be able to analyse the issues and formulate, justify and present plausible and appropriate solutions to business problems.

- 1. How to do a professional job (2.5%)
- 2. Stakeholders and their needs (7.5%)
- 3. The risk, regulatory, external, investment and business environment (40%)
- 4. Specifying the problem to solve (5%)
- 5. Data (2.5%)
- 6. Risk management (5%)
- 7. Generating the solution to the problem (30%)
- 8. Living with the solution (5%)
- 9. Monitoring (2.5%)

### **CA2 – Model documentation, analysis and reporting**

The aim of this subject is to ensure that the successful candidate can model data, document the work (including maintaining an audit trail for a fellow student and senior actuary), analyse the methods used and outputs generated and communicate to a senior actuary the approach, results and conclusions.

- 1. Preparation and exploratory analysis of data (20%)
- 2. Development of a model with clear documentation (20%)
- 3. Analysis of methods and model outputs (20%)
- 4. Application and interpretation of results (20%)
- 5. Communication of results and conclusions (20%)

### **Specialist Technical and Application**

#### **ST5 – Finance and Investment Specialist Technical**

The aim of ST5 is to instil in successful candidates the key principles of evaluating investments, including the appropriate selection and effective risk management of a portfolio of investments which meet the needs of a particular investor.

- 1. The economic and investment framework, including index construction
- 2. Specialist investment products
- 3. Valuing investments
- 4. Monitoring and managing investment risks
- 5. Investor characteristics, including taxation and behavioural finance
- 6. Appropriate investment strategies
- 7. Portfolio management and risk control
- 8. Analysing portfolio performance, including use of indices

### **ST6 – Financial Derivatives Specialist Technical**

The aim of ST6 is to instil in successful candidates the ability to value financial derivatives, including credit derivatives, and to assess and manage the risks associated with a portfolio of derivatives, including credit derivatives.

1. Characteristics of derivative products
2. The derivatives markets and derivative trading
3. Pricing derivative investments
4. Interest rate models
5. Hedging strategies
6. Managing risks relating to derivative uses

### **SAX – Finance, Investment and Banking**

The aim of SAX is to instil in successful candidates the ability to apply knowledge of the UK financial environment and the principles of actuarial practice to the financial management of firms, investors and banking organisations which are based in the UK.

1. Legislative and regulatory framework for financial management of corporate, investment, banking, insurance and pension fund organisations in the UK
2. Meeting investment or financing requirements in the UK, including investment strategies to meet liabilities
3. Management and risk control for an investment manager, including portfolio management
4. Management of capital and risk control for a corporate entity
5. Management of capital, liquidity and risk control for a bank