

## Financial mathematics

Existing topic	Mapping to draft syllabus	Comment
• Deterministic theory of interest rates	5.3.2 Explain real and nominal interest rates...	
• Generalised cash-flow models	5.3.1 Calculate present and accumulated values of cash flows...	
• Introduction to contingent claims analysis	7.6.1 Define simple contracts for contingent payments...	
• Term structure models	2.2.5 Describe the properties of various stochastic models... 5.3.4 Explain the principle concepts and terms underlying the theory of a term structure...	
• Risk neutral valuation, including derivative pricing and deflators	2.2.4 Explain the concepts underlying the risk-neutral and state price deflator...	
• Stochastic calculus for finance		Removed from core syllabus as considered specialist
• Stochastic theory of interest	2.2.5 Describe the properties of various stochastic models 5.3.6 Calculate expected present values and variances of cash flows...	
• Dynamic portfolio management	2.4 Investment strategy and performance measurement	
• Introductory applications to insurance and other financial liabilities	2.4.1 Explain how asset/liability modelling can be used... 5.3.1 Calculate present and accumulated values of cash flows...	

## Probability

Existing topic	Mapping to draft syllabus	Comment
• Concepts of probability	1.9 Probability	Subsumed into later topics under this heading
• Random variables and their characteristics	8.1 Random variables	
• Methods and properties of estimation	8.2 Statistical inference e.g. 8.2.3 Describe the main methods of estimation..	
• Correlation and regression analysis	8.3 Regression, especially 8.3.1 Explain linear relationships between variables using correlation analysis and regression analysis.	
• Hypothesis testing and confidence intervals	8.2.4 Construct confidence intervals for unknown parameters. 8.2.5 Test hypotheses	
• Data analysis	3.2 Data analysis	

## Economics

Existing topic	Mapping to draft syllabus	Comment
<ul style="list-style-type: none"> <li>• Microeconomics</li> </ul>	4.2 Business application of microeconomics	
<ul style="list-style-type: none"> <li>• Macroeconomics</li> </ul>	4.1 Macroeconomics	
<ul style="list-style-type: none"> <li>• Financial Economics               <ul style="list-style-type: none"> <li>• Expected utility theory</li> <li>• Efficient Markets Hypothesis</li> <li>• Asset return models and asset pricing models</li> <li>• Behavioural finance: prospect theory, investor heuristics and biases</li> </ul> </li> </ul>	4.2.1 Explain the concept of utility...  2.2.3 Explain the concepts of: efficient market... 4.3.2 Explain asset pricing models...  4.3.2 Explain asset pricing models...  4.3.14 Explain the main findings of behavioral finance...	Could also be considered under 4.3.14       To be modified to include market participants other than investors

## Accounting

Existing topic	Mapping to draft syllabus	Comment
<ul style="list-style-type: none"> <li>• Basic principles of accounting</li> </ul>	5.1.3 Explain fundamental accounting concepts and terms... (5.1.2) Explain why companies are required to produce annual reports and accounts	
<ul style="list-style-type: none"> <li>• The role of accounting standards</li> </ul>	5.1.3 ...and describe the main sources of accounting regulation (5.1.2) Explain why companies are required to produce annual reports and accounts	
<ul style="list-style-type: none"> <li>• Different types of business entity</li> </ul>	5.4.1 Describe different possible structures for a business entity...	
<ul style="list-style-type: none"> <li>• Basic structure of company accounts</li> </ul>	5.1.5 Explain the basic structure of company and group accounts	
<ul style="list-style-type: none"> <li>• Interpretation and limitation of company accounts</li> </ul>	5.1.6 Explain the purpose of the main components of company accounts and interpret them 5.1.7 Construct simple statements of financial position and profit or loss 5.1.8 Calculate and interpret financial and accounting ratios	

## Modelling

Existing topic	Mapping to draft syllabus	Comment
• Model structures	7.1.3 Explain the difference between a stochastic and a deterministic model...	
• Selection process	7.1.5 Describe, in general terms, how to decide whether a model is suitable...	
• Calibration	7.1.1 Describe why and how models are used...	Also covered under various objectives covering model fitting in Statistics and Data & Systems
• Validation	7.1.7 Describe, in general terms, how to analyze the potential output from a model...	
• Scenario setting	7.1.4 Describe the characteristics of, and explain the use, of scenario-based and proxy models	
• Sensitivity testing	7.1.10 Describe the process of sensitivity testing of assumptions...	
• Limitations	7.1.2 Explain the benefits and limitations of modelling	
• Computer applications of modelling	Most of 3 Data & Systems, and 8.5 Simulation	
• Documentation and audit trail	7.1.11 Produce an audit trail... 7.1.12 Explain the factors that must be considered when communicating...	

## Statistical methods

Existing topic	Mapping to draft syllabus	Comment
<ul style="list-style-type: none"> <li>Statistical models, such as regression and time series</li> </ul>	8.3 Regression 7.7.4 Describe and apply the main concepts underlying the analysis of time series models	
<ul style="list-style-type: none"> <li>Survival and multi-state models</li> </ul>	8.2.6 Estimate empirical survival and loss distributions... 7.5 Survival models	
<ul style="list-style-type: none"> <li>Risk models (individual and collective)</li> </ul>	7.2 Fundamentals of severity 7.3 Fundamentals of frequency models 7.4 Fundamentals of aggregate models	
<ul style="list-style-type: none"> <li>Parametric and non parametric analysis of data</li> </ul>	3.2 Data analysis 8.5.4 Use simulation to determine the p-value for a hypothesis test 8.5.5 Use the bootstrap method...	
<ul style="list-style-type: none"> <li>Graduation principles and techniques</li> </ul>	3.2.4 Use a computer package to fit a statistical distribution...	Concepts of model fitting and goodness of fit are covered in Data & Systems. "Graduation" as applied particularly to mortality models may be specialist.
<ul style="list-style-type: none"> <li>Estimation of frequency, severity and survival distributions</li> </ul>	7.2 Fundamentals of severity 7.3 Fundamentals of frequency models 7.4 Fundamentals of aggregate models 8.3 Regression	
<ul style="list-style-type: none"> <li>Credibility theory</li> </ul>	8.4.2 Explain and apply Bayesian and empirical Bayesian credibility models 8.4.3 Explain and apply limited fluctuation credibility	
<ul style="list-style-type: none"> <li>Ruin theory</li> </ul>		Removed as less important in practice given the use of Dynamic Financial Analysis
<ul style="list-style-type: none"> <li>Concepts of stochastic processes</li> </ul>	7.4.1 Compute... for collective risk models 7.5 Survival models	
<ul style="list-style-type: none"> <li>Simulation methods</li> </ul>	8.5 Simulation	

## Actuarial mathematics

Existing topic	Mapping to draft syllabus	Comment
<ul style="list-style-type: none"> <li>• Nature of the events giving rise to a contingency</li> </ul>		
<ul style="list-style-type: none"> <li>• Typical solutions offered by insurance, social insurance, other financial services, or risk management e.g. products, schemes, contracts or transactions that will provide payments or benefits on future financial events in relation to:                             <ul style="list-style-type: none"> <li>The risk profile and aims of the parties involved</li> <li>The concepts of risk avoidance, risk transfer and risk retention</li> <li>The level and form of cash flows to be provided</li> <li>Any options or guarantees that may be included</li> <li>The method of financing the cash flows to be provided</li> <li>The choice of assets when payments or benefits are funded</li> <li>The charges that will be levied</li> <li>The capital requirements</li> </ul> </li> </ul>	6.2.2 Describe the main participants in financial markets... 6.3.1 Describe the main types of financial products... 9.2.2 Explain how the design of different products and services affects the risk exposure... 9.2.3 9.2.3 Explain how the characteristics of the parties to a transaction affects... 9.4.1 Explain the most common risk mitigation and management techniques... 6.3.1 Describe the main types of financial products... 7.6.5 Describe and apply projected cash flow techniques in pricing, reserving, and assessing profitability 7.6.5 Describe and apply projected cash flow techniques in pricing, reserving, and assessing profitability 2.3.1 Explain the principles and objectives of investment management 7.6.5 Describe and apply projected cash flow techniques in pricing, reserving, and assessing profitability 9.3.1 Explain the use of models for risk management... 7.7.2 Describe the process of capital modelling	To be strengthened following Zurich feedback
<ul style="list-style-type: none"> <li>• Actuarial methods for evaluating the prospective cost of solutions, e.g.:                             <ul style="list-style-type: none"> <li>Pricing of insurance contracts</li> <li>Financing methods for other products or plans</li> <li>Financial effects of other risk management solutions</li> </ul> </li> </ul>	7.6 (Modelling) Actuarial applications e.g. 7.6.2 Apply survival models to simple problems in long-term insurance, pensions and banking...	
<ul style="list-style-type: none"> <li>• Actuarial methods for monitoring the results and maintaining financial stability, such as:                             <ul style="list-style-type: none"> <li>Reserving</li> <li>Financial Reporting</li> <li>Reinsuring</li> <li>Profitability analysis</li> </ul> </li> </ul>	7.6.2 Apply survival models to simple problems in long-term insurance, pensions and banking... 9.4.1 Explain the most common risk mitigation and management techniques: 9.4 Risk mitigation and management 7.4.3 Evaluate the effect of coverage modifications (deductibles, limits and coinsurance)... 7.6.5 Describe and apply projected cash flow techniques in pricing, reserving, and assessing profitability	Reinsurers will be added to 6.2.2

## Actuarial mathematics

Financial condition analysis

5.1.8 Calculate and interpret financial and accounting ratios  
9.3 Risk measurement and modelling  
9.4 Risk mitigation and management



## Investment

Existing topic	Mapping to draft syllabus	Comment
• The objectives of institutional and individual investors	2.3.1 Explain the principles and objectives of investment management...	
• Types of investment (bonds, shares, property and derivatives)	2.1.1 Describe the characteristics of the main investment assets...	
• Valuation of investments	2.2 Asset valuation.	
• Portfolio selection - incorporating assessment of relative value	2.3.2 Describe methods for the valuation of asset portfolios... 2.4.1 Explain how asset/liability modelling can be used...	
• Performance measurement	2.4.4 Analyze the performance of an investment portfolio relative to a benchmark	
• Portfolio management	2.3 Portfolio management	
• Management of investments with respect to liabilities using techniques such as immunisation, asset-liability management and liability driven investment.	2.4.1 Explain how asset/liability modelling can be used... 9.4.3 Describe the principles of asset / liability management	

## Actuarial Risk Management

Existing topic	Mapping to draft syllabus	Comment
<ul style="list-style-type: none"> <li>• The general operating environment of the enterprise</li> </ul>	9.1 The risk environment	
<ul style="list-style-type: none"> <li>• Assessment of risks; risk types and risk measures</li> </ul>	9.2.1 Describe and classify different types of risk...	
<ul style="list-style-type: none"> <li>• Design and development of products and/or services</li> </ul>	9.2.2 Explain how the design of different products and services affects the risk exposure...	
<ul style="list-style-type: none"> <li>• Pricing of products and services and assumptions underlying the pricing</li> </ul>	9.3.1 Explain the use of models for risk management in the context of: a) Pricing...	
<ul style="list-style-type: none"> <li>• Reserving and valuation of liabilities</li> </ul>	9.3.1 Explain the use of models for risk management in the context of: ... b) Reserving, c) Valuation	
<ul style="list-style-type: none"> <li>• Management of risks and methods of reducing risk exposure, such as reinsurance</li> </ul>	9.4.1 Explain the most common risk mitigation and management techniques	
<ul style="list-style-type: none"> <li>• Management of the relationships between assets and liabilities</li> </ul>	9.4.2 Describe the principles of asset / liability management and apply them...	
<ul style="list-style-type: none"> <li>• Monitoring the experience and exposure to risk</li> </ul>	9.4.1 Explain the most common risk mitigation and management techniques: ... e) monitoring	
<ul style="list-style-type: none"> <li>• Solvency and profitability of the enterprise and the management of capital</li> </ul>	9.3.1 Explain the use of models for risk management... 9.4.4 Explain the implication of risk for capital requirement...	
<ul style="list-style-type: none"> <li>• Principles of regulation of financial institutions</li> </ul>	9.1.3 Describe aspects of the operating environment relevant to the ERM process: a) the legislative and regulatory environment...	

## Professionalism

Existing topic	Mapping to draft syllabus	Comment
<ul style="list-style-type: none"> <li>• Characteristics and standards of a profession including the need for:               <ul style="list-style-type: none"> <li>Specialised skill and education</li> <li>Ongoing training and development</li> <li>High quality of advice</li> <li>Exercise of independent judgement</li> <li>Objectivity, integrity and accountability</li> </ul> </li> </ul>	10.3.1 Explain the elements of a profession	
<ul style="list-style-type: none"> <li>• Code of conduct</li> </ul>	10.3.2 Explain the role of professional standards and ethics in an actuary's work	
<ul style="list-style-type: none"> <li>• Discipline process</li> </ul>	10.3.3 Explain how the profession's discipline process applies to a member	
<ul style="list-style-type: none"> <li>• Practice standards set by actuarial bodies and other stakeholders</li> </ul>	10.3.2 Explain the role of professional standards and ethics in an actuary's work	
<ul style="list-style-type: none"> <li>• Considerations for actuaries in international practice</li> </ul>	10.3.2 Explain the role of professional standards and ethics in an actuary's work	In-depth understanding of this topic is usually only required by experienced actuaries
<ul style="list-style-type: none"> <li>• Regulatory roles of actuaries</li> </ul>	10.3.6 Explain the actuary's obligations to clients, regulators and the public	
<ul style="list-style-type: none"> <li>• The professional role of the actuary               <ul style="list-style-type: none"> <li>Analysis and resolution of ethical issues</li> <li>Identifying and managing conflicts, misuse of or undue influence on advice</li> <li>Nature of advice</li> <li>The public interest</li> </ul> </li> </ul>	10.3.6 Explain the actuary's obligations to clients, regulators and the public 10.3.7 Explain the need to select professional responsibility over personal gain and to prioritize public interest 10.4 Professionalism in practice	