Aum Sri Sairam

Table

MBA Actuarial Science Specialization

MBA – Actuarial Specialization	Credits	SEMESTER	Professional Exam Equivalent CAS/SOA/IFOA
Financial Mathematics Application in Risk Management	4	2	FM
Actuarial Risk Management - Foundation	4	2	CP1 - 1
Probability and Statistics Application in Risk Management	4	3	Р
Actuarial Risk Management - Advanced	4	3	CP1 - 2
Enterprise Risk Management - Foundation	4	3	ST9 - 1
Rate Making	4	3	Exam5 -1
Actuarial Communication	3	3	CP3
Enterprise Risk Management - Advanced	4	4	ST9 - 2
Estimating Claim Liabilities (Reserving)	4	4	Exam5 -2
Business Accounting and Financial Reporting	4	4	CB1 +Exam 6 Reporting
Actuarial Modelling	3	4	CP2
	42		

MBA Actuarial Specialization covers 9 professional actuarial exams

MBA Financial Mathematics Application in Risk Management

SEMESTER -2

Course Objectives:

- perform calculations relating to present value, current value, and accumulated value.
- calculate present value, current value, and accumulated value for sequences of non-contingent payments.
- key concepts concerning loans and how to perform related calculations.
- key concepts concerning bonds, and how to perform related calculations.
- key concepts concerning yield curves, rates of return, measures of duration and convexity, cash flow matching and immunization, and how to perform related calculations.

Unit I

Define and recognize the definitions of the following terms: interest rate (rate of interest), simple interest, compound interest, accumulation function, future value, current value, present value, net present value, discount factor, discount rate (rate of discount), convertible monthly, nominal rate, effective rate, inflation and real rate of interest, force of interest, equation of value.

Given any three of interest rate, period of time, present value, and future value, calculate the remaining item using simple or compound interest. Solve time value of money equations involving variable force of interest.

Given any one of the effective interest rate, the nominal interest rate convertible monthly, the effective discount rate, the nominal discount rate convertible m-thly, or the force of interest, calculate any of the other items

Unit 2

(10 Hrs)

Write the equation of value given a set of cash flows and an interest rate Define and recognize the definitions of the following terms: annuity-immediate, annuity due, perpetuity, payable m-thly or payable continuously, level payment annuity, arithmetic increasing/decreasing annuity, geometric increasing/decreasing annuity, term of annuity.

For each of the following types of annuity/cash flows, given sufficient information of immediate or due, present value, future value, current value, interest rate, payment amount, and term of annuity, calculate any remaining item.

a. Level annuity, finite term.

(10 Hrs)

(4 Credits)

- b. Level perpetuity.
- c. Non-level annuities/cash flows.
 - i. Arithmetic progression, finite term and perpetuity.
 - ii. Geometric progression, finite term and perpetuity. Other non-level annuities/cash flows.

Unit 3

(10 Hrs)

Define and recognize the definitions of the following terms: principal, interest, term of loan, outstanding balance, final payment (drop payment, balloon payment), amortization.

Calculate:

- d. The missing item, given any four of: term of loan, interest rate, payment amount, payment period, principal.
- e. The outstanding balance at any point in time.
- f. The amount of interest and principal repayment in a given payment.
- g. Similar calculations to the above when refinancing is involved.

Define and recognize the definitions of the following terms: price, book value, market value, amortization of premium, accumulation of discount, redemption value, par value/face value, yield rate, coupon, coupon rate, term of bond, callable/non-callable, call price, call premium, accumulated value with reinvestment of coupons

Unit 4

(10 Hrs)

Given sufficient partial information about the items listed below, calculate any of the remaining items

- h. Price, book value, market value, accumulated value with reinvestment of coupons, amortization of premium, accumulation of discount. (Note that valuation of bonds between coupon payment dates will not be covered).
- i. Redemption value, face value.
- j. Yield rate.
- k. Coupon, coupon rate.
- 1. Term of bond, point in time that a bond has a given book value, amortization of premium, or accumulation of discount.

Calculate the price of a callable bond to achieve a specified minimum yield

Define and recognize the definitions of the following terms: yield rate/rate of return, current value, duration and convexity (Macaulay and modified), portfolio, spot rate, forward rate, yield curve, cash flow and duration matching, and immunization (including full immunization and Redington immunization).

Unit 5

Calculate:

- a. The duration and convexity of a set of cash flows.
- b. Either Macaulay or modified duration given the other.
- c. The approximate change in present value due to a change in interest rate, o Using 1st-order linear approximation based on modified duration. o Using 1st-order approximation based on Macaulay duration.
- d. The present value of a set of cash flows, using a yield curve developed from forward and spot rates.

Construct an investment portfolio to: Protect the value of an asset-liability portfolio using either Redington or full immunization , Exactly match a set of liability cash flows

- 1. Broverman, S.A., Mathematics of Investment and Credit (Seventh Edition), 2017, ACTEX Publications, ISBN 978-1-63588-221-6
- 2. Vaaler, L.J.F., Harper, S.K., and Daniel, J.W. Mathematical Interest Theory (Third Edition), 2019, The Mathematical Association of America, ISBN: 978-1-4704-4393-1
- 3. Brown, R and Kopp, S, Financial Mathematics: Theory and Practice, 2012, Reprint: ACTEX Learning, Published by McGraw-Hill Ryerson: ISBN: 978-1-63588-694-8
- Francis, J. and Ruckman, C., Interest Theory Financial Mathematics and Deterministic Valuation; (Third Edition), 2022, Actuarial Brew, ISBN 978-09981604-4-3
- 5. Chan, Wai-Sum, and Tse, Yiu-Kuen, Financial Mathematics for Actuaries, Third Edition 2022, World Scientific Publishing ISBN: 978-9811243271 (hard cover) or 978-9811245671 (paperback).

MBA Actuarial Risk Management – Foundation **SEMESTER -2**

Course Objectives:

- The student will understand how to apply the underlying actuarial principles, mathematical and statistical techniques as well a business finance and economics concepts
- to analyse a range of problems and issues in commercial and business environments, focussing on problems and issues in financial services, with application to wider domains and industries.

Unit I

Understand the clients that actuaries advise and the considerations to ensure that this advice meets the needs of stakeholders Understand the main benefits and financial products that actuaries advise on

Unit II

1. Understand the regulatory environment for an organisation Understand the various external forces on an organisation and their impact

Unit III

Understand the impact of the investment environment Apply the Actuarial Control Cycle for an organisation

Unit IV (10 Hrs) Understand the principles of organisational risk governance Identify risks and understand how risk classification can be used in the design of financial products or for actuarial problem solving Understand and apply the main methods of measuring and monitoring risk that can be used

Unit V

Understand the main factors to be considered in deciding on the contract design of financial products

Recognise the potential risks and issues in working with data and understand how to manage those issues and risks

Essential Reading:

CP1 - Actuarial Practice Study Guide, the Institute and Faculty of Actuaries (IFoA, UK).

(10 Hrs)

(8 Hrs)

(10 Hrs)

(10 Hrs)

MBA Probability and Statistics Application in Risk Management SEMESTER -3 (4 Credits)

Course Objectives:

- basic probability concepts, combinatorics, and discrete mathematics.
- key concepts concerning discrete and continuous univariate random variables (including binomial, negative binomial, geometric, hypergeometric, Poisson, uniform, exponential, gamma, normal, lognormal, and beta) and their applications.
- key concepts concerning multivariate discrete random variables, the distribution of order statistics, and linear combinations of independent random variables, along with associated applications.

Unit I

Define set functions, Venn diagrams, sample space, and events. Define probability as a set function on a collection of events and state the basic axioms of probability. Calculate probabilities using addition and multiplication rules.

Define independence and calculate probabilities of independent events.

Calculate probabilities of mutually exclusive events.

Define and calculate conditional probabilities.

Unit II

Calculate probabilities using combinatorics, such as combinations and permutations. State Bayes Theorem and the law of total probability and use them to calculate conditional probabilities.

Explain and apply the concepts of random variables, probability, probability density functions, and cumulative distribution functions.

Calculate conditional probabilities.

Explain and calculate expected value and higher moments, mode, median, and percentile.

Unit III

Explain and calculate variance, standard deviation, and coefficient of variation. Apply the concepts of deductibles, coinsurance, benefit limits, and inflation to convert a given loss amount from a policyholder into the corresponding payment amount for an insurance company.

(10 Hrs)

(10 Hrs)

(10 Hrs)

Calculate the expected value, variance, and standard deviation of both the loss random variable and the corresponding payment random variable upon the application of policy adjustments.

Determine the sum of independent random variables (Poisson and normal). Explain and perform calculations concerning joint probability functions and cumulative distribution functions for discrete random variables only.

Unit IV

(10 Hrs)

Determine conditional and marginal probability functions for discrete random variables only.

Calculate moments for joint, conditional, and marginal discrete random variables. Calculate variance and standard deviation for conditional and marginal probability distributions for discrete random variables only.

Calculate joint moments, such as the covariance and the correlation coefficient for discrete random variables only.

Determine the distribution of order statistics from a set of independent random variables.

Unit V

(8 Hrs)

Calculate probabilities for linear combinations of independent normal random variables.

Calculate moments for linear combinations of independent random variables. Apply the Central Limit Theorem to calculate probabilities for linear combinations of independent and identically distributed random variables.

- 1. A First Course in Probability (Tenth Edition), 2019, by Ross, S.M., Pearson, ISBN: 978-0134753119
- Mathematical Statistics with Applications (Seventh Edition), 2008, by Wackerly, D., Mendenhall III, W., Scheaffer, R., Thomson Brooks/Cole ISBN: 978-0495110811
- 3. Probability for Risk Management, (Third Edition), 2021, by Hassett, M., Stewart, D., Milovanovic, J., ACTEX, ISBN: 978-1-64756-322-6
- 4. Probability and Statistics with Applications: A Problem-Solving Text, (Second Edition) 2015, by Asimow, L. and Maxwell, M., ACTEX, ISBN: 978-1-62542-472-3
- 5. Probability and Statistical Inference (Tenth Edition), 2020, by Hogg, R.V., Tanis, E.A., and Zimmerman, D.L., Prentice Hall, ISBN: 978-0135189399

MBA Actuarial Risk Management – Advanced **SEMESTER -3**

Course Objectives:

- The student will understand how to apply the underlying actuarial principles, mathematical and statistical techniques as well a business finance and economics concepts to a range of problems and issues in commercial and business environments,
- focussing is on problems and issues in financial services, with application to wider domains and industries.

Unit I

Understand how models are used to solve actuarial or financial problems Understand the considerations in setting the assumptions to be used for modelling an actuarial or financial problem

Unit II

Understand the considerations for determining the cost of a financial product or benefit and the price charged to the consumer Understand relevant investment management principles

Unit III

Apply relevant approaches and techniques to the valuation of liabilities Understand the relationship between assets and liabilities

Unit IV

Understand stakeholder responses to risk and how they can be managed Recognise the importance of capital for an organisation Apply appropriate techniques to manage and maintain an organisations profitability

Unit V

Analyse and understand performance and the considerations for an organisation to distribute surplus

Understand how an organisation can monitor its experience and manage risk

Essential Readings:

CP1 - Actuarial Practice Study Guide, the Institute and Faculty of Actuaries (IFoA, UK).

(10 Hrs)

(10 Hrs)

(10 Hrs)

(10 Hrs)

(8 Hrs)

MBA ERM – Enterprise Risk Management - Foundation (4 Credits) SEMESTER -3

Course Objectives:

- The student will understand the role of regulators requiring insurers to demonstrate that they are providing fair and reliable services in accordance with the statutes and regulations of each jurisdiction.
- The student will understand the types of risks faced by an entity and be able to identify and analyze these risks.

Unit I

(16 Hrs)

(16 Hrs)

Enterprise Risk Management Framework and Process:

Recommend an appropriate framework for an organization's enterprise risk management and an acceptable governance structure

Demonstrate an understanding of the perspectives of regulators, rating agencies, stock analysts, auditors, and company stakeholders and how they evaluate the risks and the risk management of an organization

Demonstrate how to articulate an organization's risk appetite, desired risk profile, quantified risk tolerances, risk philosophy and risk objectives

Assess the overall risk exposure arising from an organization's current and emerging risks

Propose ERM solutions or strategies that effectively manage risk under different real (case study) and hypothetical situations facing financial and non-financial organizations

Unit II

Risk Categories and Identification:

The Candidate will understand the types of risks faced by an entity and be able to identify and analyze these risks.

- 1. Describe different definitions and concepts of risk
- 2. Discuss risk taxonomy, including an awareness of how individual risks might be categorized in different ways

Identify and analyze specific risks faced by an organization, including but not limited to: financial, environmental, operational, legal, reputational and strategic risks

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Unit III

Risk Modeling and Aggregation of Risks:

The candidate will understand the concepts of risk modeling and be able to evaluate and understand the importance of risk models.

- 2. Demonstrate how each of the financial and non-financial risks faced by an organization can be amenable to quantitative analysis
- 3. Demonstrate organization-wide risk aggregation techniques that illustrate the concept of risk diversification by incorporating the use of correlation
- 4. Evaluate and select appropriate copulas as part of the process of modelling multivariate risks
- 5. Demonstrate the use of scenario analysis and stress testing in the measurement of current and emerging risks
- 6. Demonstrate the importance of the tails of distributions, tail correlations, and low frequency / high severity events, and the use of extreme value theory to analyze these situations
- 7. Demonstrate an understanding of model and parameter risk
- 8. Evaluate and select appropriate models to handle diverse risks, including models that use a stochastic approach

- 1. Financial Enterprise Risk Management, Sweeting, Paul, 2nd Edition, 2017
- 2. Value at Risk: The New Benchmark for Managing Financial Risk, Jorion, Philippe, 3rd Edition, 2007
- 3. Quantitative Enterprise Risk Management, Hardy, Mary and Saunders, David, 2022
- 4. SP9 Actuarial Study Guide, the Institute and Faculty of Actuaries (IFoA, UK).

MBA Ratemaking (Pricing)

SEMESTER -3

Course Objectives:

- Understand the principles and methods of ratemaking, including exposure bases and data aggregation.
- Apply statistical techniques to evaluate and organize ratemaking data effectively.
- Construct and justify rate level indications and adjustments, considering external factors.
- Integrate advanced ratemaking procedures and predictive modeling into rate-setting decisions.

Unit I

Exposure Bases and Data Organization

- Define and describe exposure bases as used in the ratemaking process.
- Evaluate and select an exposure base in a given scenario for use in the ratemaking process (e.g., line of business, use cases).
- Aggregate and/or organize ratemaking data in the following ways: calendar year, policy year, accident year, report year, close year, in-force, net of reinsurance.
- Evaluate ratemaking data and analyses for errors and reasonableness.

Unit II

Losses, Adjustments, and Trend Calculations

- Separate data into groups that balance homogeneity and credibility and summarize the considerations for determining such groups.
- Calculate loss and loss adjustment expenses to be used for ratemaking (e.g., common ratios, adjustments to losses, claims-made vs occurrence coverage).
- Calculate various adjustments to the premium used for ratemaking (e.g., onleveling, premium audit).
- Calculate and apply trends (e.g., exposure, premium, losses) using different approaches (e.g., exponential, and linear analyses).

Unit III

Underwriting Provisions and Credibility

• Calculate the underwriting provisions underlying the overall rate level indication (e.g., fixed and variable expenses, profit and contingency, reinsurance costs).

(12 Hrs)

(12 Hrs)

(12 Hrs)

(4 Credits)

- Demonstrate proper handling of extraordinary losses for ratemaking purposes (e.g., large losses, catastrophes).
- Construct an overall rate level indication using the pure premium and loss ratio methods.
- Apply credibility to ratemaking analyses using different methods and justify choice of complement.

Unit IV

(12 Hrs)

Final Rate Adjustment and Alternative Ratemaking Procedures

- Select and justify a final rate change to implement beyond the calculated overall rate level indication (e.g., Operational/Marketing/Regulatory Constraints, Lifetime Value).
- Perform calculations related to alternative ratemaking procedures (e.g., classification, territory, deductibles, increased limits, coinsurance, commercial lines rating mechanisms, etc.).
- Analyze results of predictive models (e.g., GLM).
- Apply the four principles of ratemaking to a scenario.
- Understand the considerations for implementing rates to achieve an organization's goals (e.g., non-pricing solutions, minimum premium, rating algorithms).

- 1. Werner, G., and Modlin, C., Basic Ratemaking, Casualty Actuarial Society, Fifth Edition, May 2016.
- 2. Statement of Principles Regarding Property and Casualty Insurance Ratemaking, Casualty Actuarial Society, May 1988
- 3. Actuarial Standards Board of the American Academy of Actuaries, "Actuarial Standard of Practice No. 12, Risk Classification (for All Practice Areas)," revised in 2005, updated for deviation language in 2011.
- 4. Actuarial Standards Board of the American Academy of Actuaries, "Actuarial Standard of Practice No. 13, Trending Procedures in Property/Casualty Insurance," revised in 2009, updated for deviation language in 2011
- 5. Actuarial Standards Board of the American Academy of Actuaries, "Actuarial Standard of Practice No. 43, Property/Casualty Unpaid Claim Estimates," adopted in 2007, updated for deviation language in 2011.

MBA Actuarial Communication SEMESTER -3

Course Objectives:

- Provide effective written communications of a technical nature to a non-technical audience.
- These communications need to convey appropriate information without unnecessary complexity, through the use of appropriate forms of communications, use of appropriate language, and identification of the relevant issues to be addressed for the intended audience.

Unit I Identify relevant information and appropriate content

- Identify key information that must be conveyed in order for a communication to meet the objectives,
- including:
 - setting out any implications that may affect the intended recipients' decisions
 - disclosing the extent of any uncertainty involved and any limitations in the information being communicated, if that uncertainty or those limitations may affect the intended recipients 'decisions
- Assess what information is not necessary and may, if included, detract from communicating effectively
- Use numbers in a way that is appropriate for the intended recipient(s), given the objectives of the communication:
 - Prepare numerical examples, where appropriate, by drawing on some or all of the available data or creating representative numeric examples (if suitable data is not provided)
 - Prepare numerical information so that it is presented in an appropriate format (e.g. appropriate use of percentages, ratios, fractions) and level of detail (e.g. well-judged number of significant figures or decimal places)
- Be able to justify the choice of information and content

(3 Credits)

(12 Hrs)

Use an effective structure • Prepare an appropriate structure for a specific communication objective

• Justify the choice of structure

Unit III

Unit II

Adopt appropriate language

- Assess what terminology will be easily understood by the intended recipient(s)
- Explain or define necessary technical terms at an appropriate level of detail for the intended recipient(s)
- Justify the choice of language and terminology

Unit IV

Include appropriate explanation

- Set out a draft communication for the intended recipient(s), including: •
 - 0 sufficient explanatory steps
 - effective explanation
 - appropriate level of detail 0
 - technically correct information that is not misleading

Unit V

Incorporate effective communication tools

- Set out information using simple and effective communication tools:
 - Visual presentation of numerical information 0
 - Diagrams or pictures
 - Bullet points
- Justify the choice of communication tool(s) for presenting numerical information (e.g. data tables, bar charts, line charts, pie charts, scatter charts etc.)

Essential Readings:

1. CP3 - Actuarial Communications Study Guide, the Institute and Faculty of Actuaries (IFoA, UK).

(6 Hrs)

(6 Hrs)

(6 Hrs)

(6 Hrs)

MBA ERM – Enterprise Risk Management - Advanced (4 Credits) SEMESTER - 4

Course Objectives:

- The student will understand how the risks faced by an entity can be quantified and the use of metrics to measure risk
- The student will also understand to understand the concept and assessment of solvency, including ORSA and various international approaches to assessing solvency

Unit I

Risk Measures:

- The candidate will understand how the risks faced by an entity can be quantified and the use of metrics to measure risk.
- Determine risk exposures using common risk measures (e.g., VaR and TVaR) and compare the properties and limitations of such measures
- Analyze quantitative financial and non-financial data using appropriate statistical methods to assist in quantifying risk
- Analyze risks that are not easily quantifiable, such as liquidity, operational, and environmental risks

Unit II

Risk Management Tools and Techniques:

- The candidate will understand the approaches for managing risks and how an entity makes decisions about appropriate techniques.
- Demonstrate risk optimization and analyze the risk and return trade-offs that result from changes in the organization's risk profile
- Demonstrate application of the following responses to risk, including consideration of their costs and benefits: avoidance, acceptance, reduction without transfer, and transfer to a third party
- Demonstrate the use of controls for retained and residual risks
- Demonstrate how derivatives, synthetic securities, and financial contracting may be used to reduce risk within a static or dynamic hedging program
- Determine an appropriate choice of mitigation strategy for a given situation, which balances benefits with inherent costs (including exposure to moral hazard, credit, basis and other risks)
- Demonstrate the use of tools and techniques for identifying and managing credit and counterparty risk

(12 Hrs)

(20 Hrs)

- Analyze how ALM and other risk management principles can be used to establish investment policy and strategy, including asset allocation
- Demonstrate possible risk management strategies for non-financial risks
- Choose appropriate techniques to measure, model and manage various financial and non-financial risks faced by an organization

Unit III

(16 Hrs)

Capital Management:

- Demonstrate a conceptual understanding of economic measures of value and capital requirements (e.g., EVA, embedded value, economic capital, regulatory measures, and accounting measures) and their uses in decision-making processes
- Apply risk measures and demonstrate how to use them in value and capital assessment
- Propose techniques of attributing the "cost" of risk/capital/hedge strategies to business units in order to gauge performance (e.g., returns on marginal capital)
- Demonstrate the ability to develop a capital model for a hypothetical organization

- 1. Financial Enterprise Risk Management, Sweeting, Paul, 2nd Edition, 2017
- 2. Value at Risk: The New Benchmark for Managing Financial Risk, Jorion, Philippe, 3rd Edition, 2007
- 3. Quantitative Enterprise Risk Management, Hardy, Mary and Saunders, David, 2022

(4 Credits)

MBA Estimating Claims Liabilities (Reserving) **SEMESTER - 4**

Course Objectives:

- Estimation Techniques for Unpaid Claims: Explore fundamental techniques employed by actuaries to estimate unpaid claims, applicable to both insurance entities and non-insurance entities that retain risk.
- **Regulatory Frameworks**: Examine the CAS Principles and the American Academy of Actuaries' Standards of Practice, focusing on their relevance and application in the estimation of unpaid claims.
- **Practical Application and Analysis**: Develop the ability to apply estimation techniques in real-world scenarios, enhancing analytical skills in assessing the financial implications of unpaid claims for various organizations.

Unit I

Data Organization and Evaluation

- Organize reserving data by various dimensions, including calendar year, accident year, policy year, underwriting year, and report year.
- Evaluate reserving data for errors and reasonableness to ensure accuracy in estimation.
- Understand the role of homogeneity and credibility in data, emphasizing their importance in estimating unpaid claims.
- Describe the fundamentals of different types of insurance lines, such as long tail vs. short tail and low frequency vs. high frequency.
- Articulate the significance of accurate estimates of unpaid claims for financial stability and decision-making.

Unit II

Development Triangles and Estimation Techniques

- Build and analyze development triangles for loss, claim count, and allocated loss adjustment expenses (ALAE).
- Apply tail factors to adjust estimates based on observed development patterns.
- Use development triangles as diagnostic tools to identify changes and trends in loss experience, claim counts, and severity ratios.
- Calculate and evaluate various unpaid loss estimation techniques, including development/chain ladder, Bornhuetter-Ferguson, and Cape Cod methods.
- Assess the influence of operational changes on unpaid loss estimation, such as • claims processing and underwriting practices.

(12 Hrs)

(12 Hrs)

Unit III

Adjustments and Recoveries

- Adjust data and estimation techniques for changes in internal and external environments that affect claim adequacy.
- Consider the impact of large losses on reserving analysis and adjust estimates accordingly.
- Calculate and evaluate estimation techniques for recoveries from salvage, subrogation, and reinsurance.
- Analyze allocated and unallocated loss adjustment expenses to ensure comprehensive reserve evaluations.
- Monitor results for adequacy using metrics such as loss ratios, severities, pure premiums, and interim valuations.

Unit IV

Communication and External Factors

- Communicate results of reserve analyses effectively to various stakeholders including management, investors, and regulators.
- Define reinsurance concepts to calculate net, ceded, and gross losses accurately.
- Utilize external information sources to enhance reserve analysis and improve estimation accuracy.
- Evaluate the results of reserve analyses for reasonableness using established actuarial benchmarks.
- Implement ongoing monitoring processes to ensure continuous improvement in estimating unpaid claims over time.

Essential Readings:

1. Friedland, J.F., Estimating Unpaid Claims Using Basic Techniques, Casualty Actuarial Society, Third Version, July 2010.

(12 Hrs)

(4 Credits) MBA Business Accounting and Financial Reporting **SEMESTER - 4**

Course Objectives:

- Fundamental Principles of Corporate Finance and Governance: Gain a comprehensive understanding of the key principles that underpin corporate finance and governance, including the frameworks and practices that guide financial decision-making within organizations.
- Financial Instruments and Risk Management: Develop knowledge of the various instruments utilized by companies to raise capital and effectively manage financial risk, including equity, debt, and derivatives.
- Analysis of Financial Statements: Enhance skills in interpreting and analyzing the accounts and financial statements of both corporate entities and financial institutions, fostering a deeper understanding of their financial health and performance.

Unit I

Corporate governance and organisation

- The regulation of financial reporting of incorporated entities
- Key principles of corporate governance and the regulation of • companies
- Key principles of finance
- Ethical responsibilities of the owners and managers of businesses

Unit II

How corporates are financed

- Structure and methods of financing a company
- Principles of personal and corporate taxation
- Principal forms of financial instrument issued or used by private companies and the ways in which they may be issued
- Factors a company should consider when deciding on its capital structure and dividend policy
- Corporate growth, restructuring and divestment

Unit III **Evaluating projects**

- Understand the evaluation of investment projects in a corporate setting
- Interaction of the cost of capital of a company with the nature of the • investment projects it undertakes

(10 Hrs)

(10 Hrs)

(10 Hrs)

Unit IV

Constructing and interpreting company accounts

- Basic construction and principal features of the different types of company accounts and reports
- Interpreting company accounting information

Unit V

Financial Reporting

- Understand the various risk-based capital frameworks, their implementation, and their purpose in aligning insurers with economic capital-based decision making.
- Compare and contrast the fundamental principles and concepts underlying major financial reporting practices globally, such as US GAAP and IFRS 17.
- Describe the key components of IFRS 17 reporting
- Evaluate the financial health of an insurance entity.

Essential Readings:

- 1. CB1 Business Finance Study Guide, the Institute and Faculty of Actuaries (IFoA, UK).
- 2. EY, "Applying IFRS 17," 2021
- 3. Caramagno, N.; Mamane, D.; and Neilson, L., "An Introduction to IFRS 17 for P&C Actuaries," CAS Study Note, September 2021.

(8 Hrs)

(10 Hrs)

MBA Actuarial Modelling SEMESTER - 4

Course Objectives:

- Data Modeling and Documentation: Develop the ability to effectively model data by applying critical methodologies, while meticulously documenting the processes undertaken to ensure clarity and reproducibility.
- Audit Trail Creation and Maintenance: Learn to create and maintain a comprehensive audit trail that captures all steps of the data modeling process, facilitating transparency and accountability in data handling and analysis.
- Analytical Communication: Enhance skills in analyzing methods and outputs generated from data models, and effectively communicate findings, approaches, and conclusions to peers and academic professionals in a clear and engaging manner.

Unit I

Preparation and analysis of data

- Use appropriate tools for checking, cleaning, restructuring and transforming data to make it suitable for analysis
- Summarise data using appropriate analysis, descriptive statistics and graphical representation
- Select and carry out appropriate statistical tests of reasonableness
- Make appropriate assumptions about the data provided
- Repair corrupt or missing data

Unit II

Development of a model

- Plan and produce a spreadsheet model to solve a specified problem
- Create appropriate charts to support visual interpretation of the results

Unit III

Model testing

- Perform checks on the intermediate and final results of a model
- Comment on the reasonableness of the results from a model under different scenarios

(6 Hrs)

(6 Hrs)

(6 Hrs)

(3 Credits)

Unit IV

Documentation

- Create a clear audit trail, which could be followed by a senior actuary and would enable the model to
 - be worked on and corrected by a fellow student and includes:
 - key assumptions
 - description of data and model checks
 - methodology
 - reasonableness checks
- Draft a clear summary of the model and the results for a senior actuary to include:
 - the data
 - assumptions
 - approach taken
 - results
 - conclusions
 - suggested next steps to develop the model

Unit V

Communication of results and conclusions

- Provide commentary on the results from a model appropriate for the target audience. This should cover, but not be limited to:
 - Analytical comments on each stage of the results, including explaining patterns in the results and any unusual features
 - An explanation of the differences between the results under the various strategies modelled

Unit VI

Next steps

- Identify possible next steps for the client having taken into consideration the initial modelling and the results, including:
 - Possible enhancements to the model
 - Additional modelling to provide additional information to support the project's objectives

Essential Readings:

1. CP2 – Modelling Practice Study Guide, the Institute and Faculty of Actuaries (IFoA, UK).

(6 Hrs)

(6 Hrs)