R.A. Podar College of Commerce and Economics
(Autonomous)
Matunga, Mumbai.

Syllabus
and
Question Paper Pattern

of

Bachelor of Commerce with Actuarial Studies
B.Com (Actuarial Studies)

Second Year (Semester III and IV)

Under Choice Based Credit System

Academic Year 2023-2024

Faculty of Commerce

www.rapodar.ac.in

S. Y. B. Com Actuarial Studies Programme (Academic Year 2023-24)					
Course Code	**Semester III**	**Credits**	**Course Code**	**Semester IV**	**Credits**
	Elective Courses (EC)			**Elective Courses (EC)**	
30308	(1) Life Contingencies (Paper I)	3	30408	(1) Life Contingencies (Paper II)	3
30302	(2) Auditing (Techniques of Auditing and Audit Procedures) (Paper I)	3	30402	(2) Auditing (Techniques of Auditing and Audit Procedures) (Paper II)	3
	Ability/ Skill Enhancement Courses (AEC)			**Ability/ Skill Enhancement Courses (AEC)**	
30303	(3) Information Technology in BFSI (Paper I)	3	30403	(3) Information Technology in Insurance Sector (Paper II)	3
30304	(4) Documentation, Analysis and Reporting (Paper I)	2	30404	(4) Documentation, Analysis and Reporting (Paper II)	2
	Core Courses (CC)			**Core Courses (CC)**	
30305	(5) Management: Functions and Challenges	3	30405	(5) Production and Finance	3
30306	(6) Business Laws and Insurance Specific Laws	3	30406	(6) Insurance Business Regulation and Supervision	3
30307	(7) Mathematical Modeling (Survival and Stochastic Models) (Paper I)	3	30407	(7) Mathematical Modeling (Survival and Stochastic Models) (Paper II)	3
		20			**20**

Syllabus of courses of S.Y.B.Com (Actuarial Studies)
Academic Year 2023-2024
Elective Courses (EC)
Semester III
Course Code 30308
Life Contingencies – Paper I (03 Credits)

Instructional Objectives:

- The learners are made to understand the concept and is equipped to interpret mortality table.
- The learners get introduced to the existing models related to mortality.
- To make them aware of survival models and various estimators with reference to it.
- Learners are introduced to use open sources for using various processes.

Learning Outcomes:

- Learners apply the mortality analysis for insurance business.
- Learners make use of various processes related to mortality.
- They use the existing survival models with different sets of data.
- They use Microsoft Excel for calculation and estimation under survival models.

Modules at a Glance

Life Contingencies - Paper I		
Sr. No.	**Modules**	**No. of Lectures**
1	Mortality studies	15
2	Stochastic processes	15
3	Survival models	15
4	Valuation using Microsoft Excel	15
	Total No. of Lectures:	**60**

Sr. No.	Modules
1	**Mortality Studies**
	● Various mortality functions. Probabilities of living and dying. The force of mortality. Estimation of μx from the mortality table. Apply to calculations involving appropriate approximation methods for fractional ages based on uniform distribution of deaths or constant force. ● Crude death rate, Age specific death rate and Standardized death rate. ● Crude birth rate, General fertility rate, Age specific fertility rate & Total fertility rate. Gross & Net Reproduction rates. ● Explain the principles of graduation for the construction of mortality tables. ● Apply mortality experience of a pensioners' cohort to proportionately modify standard mortality rates to be used in a pension fund valuation. ● Evaluate the standard mortality table as a population model. ● Calculate curtate and complete expectation of a life at various ages.
2	**Stochastic Processes**
	● Apply multiple state Markov chain and Markov process models. ● Derive maximum likelihood estimators, using seriatim and grouped data for the transition intensities in models of transfers between states with piecewise constant transition intensities and their probabilities. ● Calculate the variances of and construct confidence intervals for the estimators. ● Apply the Cox regression model to appropriate hazard situations. ● Understand time homogenous and time in homogenous processes.
3	**Survival Models**
	● Explain the concepts of survival models. Construct and interpret select and ultimate survival models. ● Calculate and interpret standard probability functions including survival and mortality probabilities, force of mortality, and complete and curtate expectation of life. ● For models dealing with multiple lives and/or multiple states, explain the random variables associated with the model; calculate and interpret marginal and conditional probabilities, and moments. ● Describe the principal forms of heterogeneity within a population and the ways in which selection can occur. ● Estimate empirical survival and loss distributions, e.g., using: a) Kaplan-Meier estimator, including approximations for large data sets b) Nelson Aalen estimator ● Estimate transition intensities depending on age, exactly or using large sample approximations.
4	**Valuation using Microsoft Excel**

	● Logical, financial and statistical functions relevant to mortality tables and life expectancy at various ages. ● Logical, financial and statistical functions relevant to life insurance contract's pricing. ● Logical, financial and statistical functions relevant to a pension fund valuation. ● Logical, financial and statistical functions relevant to an ESOP valuation.

References:

1. Actuarial Mathematics, Bowers, L. Newton, et. al. 2nd ISBN 0938959468, Society of Actuaries
2. Survival models and their estimation 1988 Actex Publications
3. Mathematics of Finance 2nd Edition Schaum's Outline Series Peter Zima, Robert Brows Tata McGraw-Hill Publishing Company Ltd.
4. Mortality Studies, WF Scott 2000 available at https://www.coursehero.com/file/8346708/Mortality-Studies-WF-Scott/
5. Life Contingencies by Alistair Neill, Institute of Actuaries Textbook, ISBN 978-0750609173,
6. published by Butterworth-Heinemann Ltd
7. Modelling, analysis, design, and control of stochastic systems, by Kulkarni, Vidyadhar G. Springer
8. Life Contingencies by E. P. Spurgeon ISBN 1107648092, Cambridge University Press.
9. Learn Excel 2019 Essential Skills with the Smart Method, Mike Smart. ISBN 978- 1909253346
10. Excel formulas and functions, M L Humphrey ISBN 978-1637440322

Teaching Pedagogy

Use of technology, Chalk and Talk method, Group discussions, case study analysis.

Cumulative Continuous Assessment (CCA)

Method of evaluation	**Marks**
Assignment I	20
Assignment II	20
TOTAL	**40**

SEMESTER END EXAMINATION
Duration: 2 Hours

Question No.	**Particulars**		**Marks per Question**	**Total marks**
Q.1 (Unit I)	**Attempt any 3 out of 4 questions**		5	15
	A	Numerical / Theory/ Concept based Question		
	B	Numerical / Theory/ Concept based Question		
	C	Numerical / Theory/ Concept based Question		
	D	Numerical / Theory/ Concept based Question		
Q.2 (Unit II)	**Attempt any 3 out of 4 questions**		5	15
	A	Numerical / Theory/ Concept based Question		
	B	Numerical / Theory/ Concept based Question		
	C	Numerical / Theory/ Concept based Question		
	D	Numerical / Theory/ Concept based Question		
Q.3 (Unit III)	**Attempt any 3 out of 4 questions**		5	15
	A	Numerical / Theory/ Concept based Question		
	B	Numerical / Theory/ Concept based Question		
	C	Numerical / Theory/ Concept based Question		
	D	Numerical / Theory/ Concept based Question		
Q.4 (Unit IV)	**Attempt any 3 out of 4 questions**		5	15
	A	Numerical / Theory/ Concept based Question		
	B	Numerical / Theory/ Concept based Question		
	C	Numerical / Theory/ Concept based Question		
	D	Numerical / Theory/ Concept based Question		
TOTAL				**60**

Syllabus of courses of S.Y.B.Com (Actuarial Studies)
Academic Year 2023-2024
Elective Courses (EC)
Semester III
Course Code 30402
Auditing (Techniques of Auditing and Audit Procedures) -Paper I
(3 Credits)

Instructional Objectives:

- To get the learners acquainted with scope of audit.
- To make them aware of the risks and its assessment in insurance industry.
- To know RBI regulations relating to audit of NBFCs and audit framework for BFSI.
- To understand the rules and regulations governing insurance sector in India.

Learning Outcomes:

- The learner appreciates the importance of audit planning.
- They understand the risks of material mis-statement.
- They prepare an audit plan and gets to understand audit procedure.
- They understand and appreciate the rules and regulations governing the insurance sector in India.

Modules at a Glance

Auditing (Techniques of Auditing and Audit Procedures) - Paper I		
Sr. No.	**Modules**	**No. of Lectures**
1	General Audit consideration	15
2	Understanding Entity, Its Environment and Internal Control	15
3	Audit Framework for BFSI	15
4	Professional guidance for audit of BFSI	15
	Total No. of Lectures	**60**

Sr. No.	Modules
I	**General Audit Consideration**
	● Introduction. ● Scope of Audit Engagement. ● Auditors' independence and Professional Ethics. ● Audit Planning
II	**Understanding Entity, Its Environment and Internal Control**
	● Common Industry Ratio and Performance Indicator. ● Risk Indicators in Insurance Industry. ● Identifying and Assessing Risks of Material mis-statement. ● RBI Regulations relating to Audit of NBFCs.
III	**Audit Framework for BFSI**
	● Preparation of a Detailed Audit Plan. ● Use of Information Technology. ● Preparation of Entity-specific Checklist for Compliance. ● Collection of Audit Evidence. ● Documentation.
IV	**Professional Guidance for Audit of BSFI**
	● ICAI guidance note on audit of banks. ● ICAI guidance note on audit of General Insurance Companies. ● ECIIA key principles of internal audit of Insurance Companies. ● ICAI Technical guide on review and certification of investment risk management systems and processes of Insurance Companies. ● Society of Insurance Checklist on audit of insurance premiums. ● ICAI Technical guide on audit of asset management companies/mutual funds.

REFERENCE BOOKS:

1. Alvin A. Arens , Randal J. Elder, et al., Auditing and Assurance Services (16th Edition) Feb 1, 2016
2. Karla M Johnstone-Zehms, Audrey A., Auditing: A Risk Based-Approach by Gramling, et al. | Feb 14, 2018
3. Timothy Louwers, Allen Blay, et al, Auditing & Assurance Services (Auditing and Assurance Services) Feb 10, 2017)
4. Ray Whittington and Kurt Pany GEN COMBO LL PRINCIPLES OF AUDITING & OTHER ASSURANCE SERVICES; CONNECT AC , May 4, 2018
5. Jones Orumwense, Principles and Practice of Internal Auditing in the Banking Industry: A Training Guide in internal and Forensic Auditing in Banks and other financial institutions, Feb 26, 2013
6. AICPA, Audit and Accounting Guide - Depository and Lending Institutions: Banks and Savings Institutions, Credit Unions, Finance Companies, and Mortgage Companies (AICPA Audit and Accounting Guide) Oct 23, 2018
7. Saloni Ramakrishna Enterprise Compliance Risk Management: An Essential Toolkit for Banks and Financial Services (Wiley Corporate F&A Book 641)

Teaching Pedagogy

Use of technology, Group discussions, case study analysis.

Cumulative Continuous Assessment (CCA)

Method of evaluation	**Marks**
Class test	15
Power Point presentation	20
Class Participation & attendance	5
TOTAL	**40**

SEMESTER END EXAMINATION

Duration: 2 Hours

Question No.	**Particulars**		**Marks per Question**	**Total marks**
Q.1 (Unit I)	**Attempt any 3 out of 4 questions**		5	15
	A	Numerical / Theory/ Concept based Question		
	B	Numerical / Theory/ Concept based Question		
	C	Numerical / Theory/ Concept based Question		
	D	Numerical / Theory/ Concept based Question		
Q.2 (Unit II)	**Attempt any 3 out of 4 questions**		5	15
	A	Numerical / Theory/ Concept based Question		
	B	Numerical / Theory/ Concept based Question		
	C	Numerical / Theory/ Concept based Question		
	D	Numerical / Theory/ Concept based Question		
Q.3 (Unit III)	**Attempt any 3 out of 4 questions**		5	15
	A	Numerical / Theory/ Concept based Question		
	B	Numerical / Theory/ Concept based Question		
	C	Numerical / Theory/ Concept based Question		
	D	Numerical / Theory/ Concept based Question		
Q.4 (Unit IV)	**Attempt any 3 out of 4 questions**		5	15
	A	Numerical / Theory/ Concept based Question		
	B	Numerical / Theory/ Concept based Question		
	C	Numerical / Theory/ Concept based Question		
	D	Numerical / Theory/ Concept based Question		
TOTAL				**60**

Syllabus of courses of S.Y.B.Com (Actuarial Studies)
Academic Year 2023-2024
Ability Enhancement Courses (AEC)
Semester III
Course Code 30303
Information Technology in BFSI - Paper I (3 Credits)

Instructional Objectives:

- To make the learner understand the growing importance of IT in BFSI.
- To make them aware about Data Base System in BFSI.
- To enable them use MS Office for managing office.
- To equip them with presentation skills.

Learning Outcomes:

- The learner knows and deals with IT infrastructure in BFSI.
- They become aware of software related to BFSI.
- They appreciate the benefits of MS Office and the ease of managing an automated office.
- The learners make effective power point presentations.

Modules at a Glance

Information Technology in BFSI – Paper I		
Sr. No.	**Modules**	**No. of Lectures**
1	Introduction to Information Technology	15
2	Data Base System in BFSI	15
3	Internet and Information Technology	15
4	Office Automation using MS Office, Advance Excel	15
	Total No. of Lectures:	**60**

Sr. No.	Modules
I	**Introduction to Information Technology**
	• Concepts related to Information Technology: Data, Information, Data Base Information system. • Major components of Information System: Types and Levels of Information System – CBIS (Computer Based Information System) Office Automation system Management Information System, Transaction Processing System, Decision Support System, Executive Information system, CRM. • IT architecture in BFSI – Policy administration., G-Ledger, Fund accountability • Co-existence of various systems in BFSI
II	**Data Base System in BFSI**
	• Data Base Management System (DBMS) and Role of DBMS as the interface between user and data base. • Data Base Management System: Structure and Features. • Meaning and purpose of Data Dictionary, File Manager, Role of Data Base Administer, Traditional File system v/s Data Base System. • Data Base Organization: Definition and major Characteristics of Flat File, Relational File, Hierarchical File, Network File and Object-Oriented File. • Introduction to Finacle, life Asia and others
III	**Internet and Information Technology**
	• Introduction to Internet. • Internet Utility Software based on Client Server Technology. • Internet Service Provider and Internet Protocol: Website, Webpage Construction, Web server, Web Browser (URL, HTML, History, Hyperlinks, Bookmark) – Basic knowledge of SMTP, POP, IMAP, FTP, HTTP, TCP, IP. • Security: Internet based frauds, Hacking of password, Viruses, Encryption & Decryption Keys, Firewall, Digital Signatures and Certificates, • E-commerce.
IV	**Office Automation using MS Office, Advance Excel**
	• Creating and saving of word document: Editing and Formatting Features, designing file page and preparing index. • Spread Sheet Application: Creating, saving and editing spread sheets and drawing charts. • Use of basic functions such as Text, Mathematical and Statistical, Financial and Logical. • Use of advanced functions including use of V- lookup, H-lookup. • Data Analysis and validation, Sorting and filtering of data, 'what if -' analysis using data tables and scenarios, Creating subtotals and Grand Totals, Pivot tables/charts • Presentation software: Creating presentation with minimum 20 slides with Script, Inserting pictures, Videos, Animation.

	• Advance Excel: Unit linked and accumulating with profits contracts, Profit testing, reserving aspects of profit testing, Practical application.

References:

1. Information Technology for Management, 6TH ED (With CD) By Efraim Turban, Dorothy Leidner, Ephraim Mclean, James Wetherbe (Ch1, Ch2) 2.
2. Microsoft Office Professional 2013 Step by Step By Beth Melton, Mark Dodge, Echo Swinford, Andrew Couch 3.
3. Tata McGraw Hill Joseph, P.T. : E-commerce An Indian Perspective (Ch-13,Ch-14)

Teaching Pedagogy

Use of FinTech Lab, demonstration of software, practical assignment.

Cumulative Continuous Assessment (CCA)

Method of evaluation	**Marks**
Application of advanced Excel	35
Class Participation & attendance	5
TOTAL	**40**

SEMESTER END EXAMINATION

Duration: 2 Hours

Question No.	**Particulars**		**Marks per Question**	**Total marks**
Q.1 (Unit I)	**Attempt any 3 out of 4 questions**		5	15
	A	Numerical / Theory/ Concept based Question		
	B	Numerical / Theory/ Concept based Question		
	C	Numerical / Theory/ Concept based Question		
	D	Numerical / Theory/ Concept based Question		
Q.2 (Unit II)	**Attempt any 3 out of 4 questions**		5	15
	A	Numerical / Theory/ Concept based Question		
	B	Numerical / Theory/ Concept based Question		
	C	Numerical / Theory/ Concept based Question		
	D	Numerical / Theory/ Concept based Question		
Q.3 (Unit III)	**Attempt any 3 out of 4 questions**		5	15
	A	Numerical / Theory/ Concept based Question		
	B	Numerical / Theory/ Concept based Question		
	C	Numerical / Theory/ Concept based Question		
	D	Numerical / Theory/ Concept based Question		
Q.4 (Unit IV)	**Attempt any 3 out of 4 questions**		5	15
	A	Numerical / Theory/ Concept based Question		
	B	Numerical / Theory/ Concept based Question		
	C	Numerical / Theory/ Concept based Question		
	D	Numerical / Theory/ Concept based Question		
TOTAL				**60**

Syllabus of courses of S.Y.B.Com (Actuarial Studies)
Academic Year 2023-2024
Ability Enhancement Courses (AEC)
Semester III
Course Code 030304
Documentation Analysis and Reporting - Paper I (2 Credits)

Instructional Objectives:

- To make them understand the nuances of report writing, segmenting the report, the nomenclature, technicalities and flow of the report.
- To make them realise the need for an accepted format, alignment of different sections as well assub-sections of the report.
- To make the learner comprehend the use of tables, graphs and other presentation aids in the report at the appropriate places.
- To enable them to become a rapid reader.

Learning outcomes:

- Learners develop analytical skill and appreciate the rendering of collected data and information in structured manner.
- They acquire skills of arranging and sequencing the subject matter.
- They acquire skills for interpretation of data and information.
- They acquire skills to form an opinion and express it with authenticity.

Modules at a Glance

Documentation Analysis and Reporting – Paper I		
Sr. No.	**Modules**	**No. of Lectures**
1	Overview of documentation analysis and reporting	12
2	IRDAI Annual Report	12
3	Discussion on tables and graphs – interpretation thereof	12
4	Nuances of interpretation and reporting	09
	Total No. of Lectures:	**45**

Sr. No.	Modules
I	**Overview of documentation analysis and reporting**
	● Introduction to technical report reading & writing. ● Gathering the relevant information from the data.
II	**IRDAI Annual**
	● Introduction and understanding of an actual Report. ● Relevant fact analysis. ● Discarding the irrelevant data.
III	**Discussion on tables and graphs – interpretation thereof**
	● Ways of Data Tabulation. ● Graphical interpretation and inferences.
IV	**Nuances of interpretation and reporting**
	● Comparing inferences from different data representations. ● Group discussions of different data techniques. ● Step by Step report writing and summary.

References:

1. IRDAI English Annual Report
2. Banking Ombudsman Report
3. Nestle India Annual Report

Teaching Pedagogy

Use of published reports, discussion, reading and presentation by the faculty.

Cumulative Continuous Assessment (CCA)

Method of evaluation	**Marks**
Class test	15
Assignment	20
Class Participation & attendance	5
TOTAL	**40**

SEMESTER END EXAMINATION

Duration: 2 Hours

Question No.	**Particulars**		**Marks per Question**	**Total marks**
Q.1 (Unit I)	**Attempt any 3 out of 4 questions**		5	15
	A	Numerical / Theory/ Concept based Question		
	B	Numerical / Theory/ Concept based Question		
	C	Numerical / Theory/ Concept based Question		
	D	Numerical / Theory/ Concept based Question		
Q.2 (Unit II)	**Attempt any 3 out of 4 questions**		5	15
	A	Numerical / Theory/ Concept based Question		
	B	Numerical / Theory/ Concept based Question		
	C	Numerical / Theory/ Concept based Question		
	D	Numerical / Theory/ Concept based Question		
Q.3 (Unit III)	**Attempt any 3 out of 4 questions**		5	15
	A	Numerical / Theory/ Concept based Question		
	B	Numerical / Theory/ Concept based Question		
	C	Numerical / Theory/ Concept based Question		
	D	Numerical / Theory/ Concept based Question		
Q.4 (Unit IV)	**Attempt any 3 out of 4 questions**		5	15
	A	Numerical / Theory/ Concept based Question		
	B	Numerical / Theory/ Concept based Question		
	C	Numerical / Theory/ Concept based Question		
	D	Numerical / Theory/ Concept based Question		
TOTAL				**60**

Syllabus of courses of S.Y.B.Com (Actuarial Studies)
Academic Year 2023-2024
Core Courses (CC)
Semester III
Course Code 30305
Management: Functions and Challenges (3 Credits)

Instructional Objectives:

- To make the learners aware of conceptual knowledge and evolution of Management.
- To familiarize the learners with the functions of Management.
- To sensitize the learners about the actual work environment and how business managers have to deal with the issues related to changes in the environment.
- To sensitize the learners about the challenges faced by managers while reconstructing organisation.

Learning Outcomes:

- The learner knows the meaning of management, evolution of management thoughts.
- The learner applies the process of Planning in day-to- day activities and is able to use Decision Making Techniques while making decisions.
- The learner understands the importance of motivation and leadership with proper controls.
- They are ready with solutions to face different types of disruptions during organisational changes.

Modules at a Glance

Management: Functions and Challenges		
Sr. No.	**Modules**	**No. of Lectures**
1	Introduction to Management	15
2	Planning & Organizing	15
3	Directing & Controlling	15
4	Management Challenges in Changing Environment	15
	Total No. of Lectures	**60**

Sr. No.	Modules
I	**Introduction To Management**
	• **Management:** Concept, Importance of Management, Functions of Management; Managerial Competencies, Levels of Management, Managerial roles based on Mintzberg's Theory. • **Evolution of Management Thoughts:** Scientific Management by F. W. Taylor's, General Management Theory by Henri Fayol, Human Relations Approach by Elton Mayo - Hawthorne experiments. • **Ancient and Modern Management Approach:** Chanakya 'Arthshastra' Management Practices by Indian Values, Peter Drucker's Dimensions of Management.
II	**Planning & Organizing**
	• **Planning** - Steps, Importance, Components; Coordination – Importance. • **M.B.O** - Process, Advantages; Management by Exception- Advantages; Management Information System- Concept, Components. • **Decision Making** -Techniques, Essentials of a Sound Decision Making. • **Organizing** - Organization Structures – Line & Staff Organization, Tall and Flat Organisation Matrix Organization, Virtual Organization, Formal/s Informal Organization.
III	**Directing and Controlling**
	• **Departmentation** –Meaning, Bases; Span of Management- Factors -Graicunas formula Influencing Span of Management. • **Delegation of Authority**- Barriers to Delegation, Measures to overcome barriers. • **Motivation**: Factors influencing Motivation. • **Leadership**: Styles and Qualities. • **Controlling**: Techniques of controlling.
IV	**Management Challenges in Changing Environment**
	• **Mergers and Acquisitions** – Challenges of integrating corporate culture. • **Turnaround** – Challenges for top management during turnaround process. • **Closure** – Procedural challenges of closing a business enterprise. • **Change and Disruptions** – Challenges posed by technology gap.

References:

1. Challenges of Indian Management by B. R. Virmani.
2. Management Challenges of 21st century by Peter F. Drucker.
3. Management Book by Richard Newton; FT Publishing.
4. Truth about Leadership by James M. Kouzes and Barry Postet.

Teaching Pedagogy

Case studies, group discussions and presentations.

Cumulative Continuous Assessment (CCA)

Method of evaluation	**Marks**
Class test	15
Power point Presentation	20
Class Participation & attendance	5
TOTAL	**40**

SEMESTER END EXAMINATION

Duration: 2 Hours

Question No.	**Particulars**		**Marks per Question**	**Total marks**
Q.1 (Unit I)	**Attempt any 3 out of 4 questions**		5	15
	A	Numerical / Theory/ Concept based Question		
	B	Numerical / Theory/ Concept based Question		
	C	Numerical / Theory/ Concept based Question		
	D	Numerical / Theory/ Concept based Question		
Q.2 (Unit II)	**Attempt any 3 out of 4 questions**		5	15
	A	Numerical / Theory/ Concept based Question		
	B	Numerical / Theory/ Concept based Question		
	C	Numerical / Theory/ Concept based Question		
	D	Numerical / Theory/ Concept based Question		
Q.3 (Unit III)	**Attempt any 3 out of 4 questions**		5	15
	A	Numerical / Theory/ Concept based Question		
	B	Numerical / Theory/ Concept based Question		
	C	Numerical / Theory/ Concept based Question		
	D	Numerical / Theory/ Concept based Question		
Q.4 (Unit IV)	**Attempt any 3 out of 4 questions**		5	15
	A	Numerical / Theory/ Concept based Question		
	B	Numerical / Theory/ Concept based Question		
	C	Numerical / Theory/ Concept based Question		
	D	Numerical / Theory/ Concept based Question		
TOTAL				**60**

Syllabus of courses of S.Y.B.Com (Actuarial Studies)
Academic Year 2023-2024
Core Courses (CC)
Semester III
Course Code 30306
Business Laws and Insurance Specific Laws (3 Credits)

Instructional Objectives:

- To familiarize the learner with the various common business laws applicable to insurance business.
- To enable the learners in understanding the evolution of insurance laws.
- To make the learner aware of the evolution and legal framework of insurance business in India.
- To make them realize the need and importance of compliance.

Learning Outcomes:

- The learner becomes knowledgeable of the basic provisions of various business laws.
- They are acquainted with the important changes made in the provisions of various business laws.
- They appreciate the regulatory framework of insurance business in India.
- The learners explores a career opportunity related to compliance.

Modules at a Glance

Business Laws and Insurance Specific Laws		
Sr. No.	**Modules**	**No. of Lectures**
1	Introduction to Business Laws-I	15
2	Introduction to Business Laws-II	15
3	Evolution of Insurance Laws in India	15
4	Regulatory Framework of Insurance Business in India	15
	Total No. of Lectures	**60**

Sr. No.	Modules
I	**Introduction to Business Laws – I**
	• India Contract Act 1872: Definition of Contract and Agreement. • Essentials of a Valid Contract – Capacity to Contract, offer, Acceptance and Consideration with respect to Insurance Contract. • Communication and Revocation of offer and acceptance, Misrepresentation, Fraud and Void Agreement, E-Contract. • Negotiable Instruments Act, 1881: Introduction and Relevance. • Concept, Characteristics and Classification of Negotiable Instruments. • Promissory Note, bill of exchange and Cheques- Features, Types and Points of Distinction. • Limitation Act and RTI Act.
II	**Introduction to Business Laws – II**
	• Indian Partnership Act, 1932: Introduction, Relevance, Partnership deed, Rights and Duties of Partners, Partnership with Ltd. Liabilities (LLP) • Setting up of a Company under Indian Company's Act, 2013 • Consumer Protection Act, 1986: Concept, Objects, Definition of Consumer, Consumer Disputes, Complaints, Complainant Rights of Consumer, Consumer Protection Council and Redressal Agencies
III	**Evolution of Insurance Laws in India**
	• Legal, Framework of Insurance business in India. • Evolution of Insurance Laws in India. • Insurance Act, 1938 • LIC of 1956 • General Insurance Related Laws- Fire, Marine and Property. • General Insurance Business (Nationalisation) Act: 1972
IV	**Regulatory Framework of Insurance Business in India**
	• Fundamental Principles of Financial Regulation- establishment of IRDAI. • Investment Regulations in India. • Institutional Structure of Insurance Regulation and Supervision. • Registration of India Insurance Company, 2000 • IRDAI appointed Actuary Regulation, 2017

References:

1. IRDAI Appointed Actuary Regulations, 2017 https://www.irdai.gov.in/ADMINCMS/cms/frmGeneral_Layout.aspx?page=PageNo3155&flag=1
2. IRDAI Investment Regulations, 2016 https://www.irdai.gov.in/ADMINCMS/cms/frmGeneral_Layout.aspx?page=PageNo2934&flag=1

Teaching Pedagogy

Topical case studies, Discussions, Role play and Presentation.

Cumulative Continuous Assessment (CCA)

Method of evaluation	**Marks**
Class test	15
Power point Presentation	20
Class Participation & attendance	5
TOTAL	**40**

SEMESTER END EXAMINATION

Duration: 2 Hours

Question No.	**Particulars**		**Marks per Question**	**Total marks**
Q.1 (Unit I)	**Attempt any 3 out of 4 questions**		5	15
	A	Numerical / Theory/ Concept based Question		
	B	Numerical / Theory/ Concept based Question		
	C	Numerical / Theory/ Concept based Question		
	D	Numerical / Theory/ Concept based Question		
Q.2 (Unit II)	**Attempt any 3 out of 4 questions**		5	15
	A	Numerical / Theory/ Concept based Question		
	B	Numerical / Theory/ Concept based Question		
	C	Numerical / Theory/ Concept based Question		
	D	Numerical / Theory/ Concept based Question		
Q.3 (Unit III)	**Attempt any 3 out of 4 questions**		5	15
	A	Numerical / Theory/ Concept based Question		
	B	Numerical / Theory/ Concept based Question		
	C	Numerical / Theory/ Concept based Question		
	D	Numerical / Theory/ Concept based Question		
Q.4 (Unit IV)	**Attempt any 3 out of 4 questions**		5	15
	A	Numerical / Theory/ Concept based Question		
	B	Numerical / Theory/ Concept based Question		
	C	Numerical / Theory/ Concept based Question		
	D	Numerical / Theory/ Concept based Question		
TOTAL				**60**

Syllabus of courses of S.Y.B.Com (Actuarial Studies)
Academic Year 2023-2024
Core Courses (CC)
Semester III
Course Code 30307
Mathematical Modeling (Survival Models & Stochastic Models)
Paper I (3 Credits)

Instructional Objective:

- To introduce basic concepts of mathematics and statistics that are relevant to survival models and stochastic models in Actuarial studies.
- To enable the learner to understand Probability distribution.
- To ensure the understanding of Kaplan Meier curves.
- To become familiar with the construction of Kaplan Meier curves.

Learning Outcomes:

- They develop hypothesis and identify testing methods.
- The learner is able to find the probabilities of different types of events and random variable in case of continuous and discrete distributions.
- They are able to apply the test of hypothesis and solve the problems.
- They can construct and analyse Kaplan Meier curves.

Modules at a Glance

Mathematical Modeling (Survival Models & Stochastic Models)-Paper I		
Sr. No.	**Modules**	**No. of Lectures**
1	Linear Models	15
2	Probability Distributions	15
3	Analysis of Models	15
4	Non-Parametric Distributions	15
	Total No. of Lectures:	**60**

Sr. No.	Modules
I	**Linear Models**
	• Basics of Statistical Learning Explain the types of modeling problems and methods, including supervised versus unsupervised learning and regression versus classification Explain the common methods of assessing model accuracy Employ basic methods of exploratory data analysis, including data checking and validation • Application of Least Square Method. • Estimation of maximum likelihood. • Monitoring models and checking assumptions using graphical and quantitative methods. • Describe and explain the components of, in particular, the exponential family of distributions and link functions.
II	**Probability Distributions**
	• Random Variables: Discrete and Continuous, Expectation and Variance of Discrete and Continuous Random Variables. • Discrete Probability Distributions: Binomial Distribution, Poisson Distribution, Uniform Distribution, Multivariate Distribution. • Continuous Probability Distributions: Normal Distribution. • Sum of independent random variables (Poisson and normal) • Joint probability functions and cumulative distribution functions for discrete random variables only. • Conditional and marginal probability functions for discrete random variables only • Moments for joint, conditional, and marginal discrete random variables • variance and standard deviation for conditional and marginal probability distributions for discrete random variables only. • Joint moments, such as the covariance and the correlation coefficient for discrete random variables only. • Distribution of order statistics from a set of independent random variables. • Probabilities for linear combinations of independent normal random variables. • 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.

III	**Analysis of Models**
	● Principal Components Analysis: Definition, Uses, Interpretation considering loading factors and proportion of variance. ● Cluster Analysis: Uses, K – means, Hierarchical, Comparison and methods of deciding the number of cluster distribution and link function. ● Variable transformation and interactions. ● Pearson chi-square statistics ● t test and F test ● AIC and BIC ● Likelihood ratio test ● Interpret model results with emphasis on using the model to answer the underlying business question Calculate and interpret predicted values, confidence, and prediction Intervals
IV	**Non-Parametric Distributions**
	● Kaplan Meier: Naive estimator, hazard function, maximum likelihood estimator. ● Kaplan Meier Analysis: Construction of Kaplan Meier curves, Analysis of Kaplan Meier curves.

References:

1. Probability and Stochastic Processes with a View Toward Applications by Breiman, L. Boston: Houghton Mifflin, 1969.
2. Introduction to Stochastic Processes by Cinlar, E. Englewood Cliffs, N.J.: Prentice-Hall, 1975.
3. The Theory of Stochastic Processes by Cox, D. R., and H. D. Miller. New York: John Wiley & Sons, 1965.
4. Introduction to Stochastic Processes by Hoel, R. G., S. C. Port, and C. J. Stone. Boston: Houghton Mifflin, 1972.
5. Finite Markov Chains by Kemeny, J. G., and J. L. Snell. New York: Van Nostrand Reinhold, 1960.
6. Elements of Applied Stochastic Processes by Bhat, U. N. New York: John Wiley & Sons, 1972.
7. An Introduction to Probability Theory and Its Applications by Feller, W. 2 vols. New York: John Wiley & Sons, 1966 (vol. 2), 1968 (vol. 1, 3rd ed.).
8. A First Course in Stochastic Processes by Karlin, S., and H. M. Taylor. New York: Academic Press, 1975.
9. An Introduction to Stochastic Modeling by H.M. Taylor,and Samual Karlin. New York: Academic Press, 3rd Edition.

   Mathematics for Economics and Finance Methods and Modelling by Martin Anthony and Norman Biggs, Cambridge University Press, Cambridge low-priced edition, 2000, Chapters 1, 2, 4, 6 to 9 & 10.
10. Applied Calculus: By Stephen Waner and Steven Constenoble, Brooks/Cole Thomson Learning, second edition, Chapter 1 to 5.
11. Business Mathematics By D. C. Sancheti and V. K. Kapoor, Sultan Chand & Sons, 2006, Chapter 1, 5, 7, 9 &10.
12. Mathematics for Business Economics: By J. D. Gupta, P. K. Gupta and Man Mohan, Tata Mc-Graw Hill Publishing Co. Ltd., 1987, Chapters 9 to 11 & 16.
13. Quantitative Methods-Part-I By S. Saha and S. Mukerji, New Central Book Agency, 1996, Chapters 7 & 12.
14. Mathematical Basis of Life Insurance By S.P. Dixit, C.S. Modi and R.V. Joshi, Insurance Institute of India, Chapters 1 and 2
15. STATISTICS by Schaum Series.
16. Fundamentals of Statistics - D. N. Elhance.
17. Statistics for Management - Lovin R. Rubin D.S. (Prentice Hall of India)
18. Statistics - Theory, Method & Applications D.S.Sancheti& V. K. Kapoor.
19. Modern Business Statistics - (Revised}-B. Pearles& C. Sullivan –Prentice Hall of India.
20. Business Mathematics &Statistics : B Aggarwal, Ane Book Pvt. Limited.
21. Business Mathematics : D C Sancheti& V K Kapoor, Sultan Chand & Sons.
22. Business Mathematics : A P Verma, Asian Books Pvt. :Limited.
23. Statistics of Management , Richard Levin &David S. Rubin,Printice Hall of India , NewDelhi.

24. Statistics for Business & Economics, David R Anderson, Dennis J Sweney, ThopmsonPublication.
25. Business Statistics , Bharadwaj , Excel Books,Delhi
26. Business Mathematics, S.K Singh & J.K Singh, Brijwasi Book Distributor &Publisher.
27. Mathematics for Economics and Finance, Martin Anthony, Norman Biggs, Cambridge lowprice editions,2000.
28. Stochastic Models for Social Processes by Bartholomew, D. J. New York: John Wiley & Sons, 1967.
29. Stochastic Population Models in Ecology and Epidemiology by Bartlett, M. S. New York: John Wiley & Sons, 1960.
30. Business Mathematics, J.K. Singh, 2009,Himalaya PublishingHouse.
31. Mathematics of Finance 2nd Edition Schaum's Outline Series Peter Zima, Robert Brows Tata McGraw-Hill Publishing Company Ltd.

Teaching Pedagogy

Practicals in FinTech Lab, Problem solving and Presentations.

Cumulative Continuous Assessment (CCA)

Method of evaluation	**Marks**
Tutorial Test I	15
Tutorial Test II	15
Assignments	10
TOTAL	**40**

SEMESTER END EXAMINATION – 60 marks

Duration: 2 Hours

Question No.	**Particulars**		**Marks per Question**	**Total marks**
Q.1 (Unit I)	**Attempt any 3 out of 4 questions**		5	15
	A	Numerical / Theory/ Concept based Question		
	B	Numerical / Theory/ Concept based Question		
	C	Numerical / Theory/ Concept based Question		
	D	Numerical / Theory/ Concept based Question		
Q.2 (Unit II)	**Attempt any 3 out of 4 questions**		5	15
	A	Numerical / Theory/ Concept based Question		
	B	Numerical / Theory/ Concept based Question		
	C	Numerical / Theory/ Concept based Question		
	D	Numerical / Theory/ Concept based Question		
Q.3 (Unit III)	**Attempt any 3 out of 4 questions**		5	15
	A	Numerical / Theory/ Concept based Question		
	B	Numerical / Theory/ Concept based Question		
	C	Numerical / Theory/ Concept based Question		
	D	Numerical / Theory/ Concept based Question		
Q.4 (Unit IV)	**Attempt any 3 out of 4 questions**		5	15
	A	Numerical / Theory/ Concept based Question		
	B	Numerical / Theory/ Concept based Question		
	C	Numerical / Theory/ Concept based Question		
	D	Numerical / Theory/ Concept based Question		
TOTAL				**60**

Syllabus of courses of S.Y.B.Com (Actuarial Studies)
Academic Year 2023-2024 *Elective Courses (EC)*
Semester IV
Course Code 30408
Life Contingencies - Paper II (03 Credits)

Instructional Objectives:

- To enable the learners, acquire knowledge about projection with respect to cash flows in life insurance and pension schemes.
- To make them understand the accounting requirements related to defined pension schemes and other employee benefit schemes.
- To make them familiar with the use of software related to Life Contingencies.
- To make the learners conversant with use of 'R' software.

Learning Outcomes:

- They are conversant with actuarial applications.
- The learner is able to project cash flows of contingent contracts.
- They are competent to calculate the pension and employee benefit under a scheme.
- They are able to use life contingency related software to construct models.

Modules at a Glance

Life Contingencies – Paper II		
Sr. No.	**Modules**	**No. of Lectures**
1	Actuarial applications I	**15**
2	Actuarial applications II	**15**
3	Defined benefits pensions: measurement, recognition and disclosures	**15**
4	Life Contingency related software	**15**
	Total No. of Lectures:	**60**

Sr. No.	Modules
1	**Actuarial Applications** -1
	• Define simple contracts for contingent payments dependent on the state of a single entity (for example life insurance or annuity benefits) on the occurrence of a particular event; develop and evaluate formulae for the means and variances of the present values of the payments under these contracts, assuming constant deterministic interest. • Apply survival models to simple problems in long-term insurance, pensions and banking such as calculating the premiums and reserves based on the equivalence principle, the portfolio percentile premium principle, and profit testing for a life insurance contract, and the potential defaults on a book of loans.Calculate and interpret probabilities, means, variances, and percentiles of random variables associated with a premium, including loss-at-issue random variables and future-loss random variables. • Calculate and interpret the effect of changes in benefits or underlying assumptions such as decrements, morbidity, expenses, and interest. • Calculate and interpret the effect of changes in underlying assumptions such as mortality and interest • Apply appropriate approximation methods such as uniform distribution of deaths, • constant force, Woolhouse, and Euler. • Calculate and interpret the following reserve types: • Net premium • Modified • Gross premium • Expense • Calculate and interpret common profit measures such as expected profit, actual profit, gain, gain by source and period, internal rate of return, profit margin, and break-even year.
2	**Actuarial Applications**-11
	• Define simple contracts for contingent payments dependent on the state of multiple entities; develop and evaluate formulae for the means of the present values of the payments under these contracts, assuming constant deterministic interest. • Describe and apply methods of projecting and valuing expected cash flows that are contingent upon multiple decrement events. • Describe and apply projected cash flow techniques in pricing, reserving, and assessing profitability of contracts for contingent payments with appropriate allowance for expenses (including life insurance and pension fund applications).
3	**Defined Benefits Pensions: Measurement, Recognition and Disclosures**

	• Accounting requirements of Measurement, Recognition and Disclosures under Ind AS 19, IAS 19 and ASC 715 (US GAAP). • Difference between Ind AS 19, IAS 19 and ASC 715 (US GAAP) on measurement, recognition and disclosures. • Explain the differences in the results on earnings and other comprehensive income arising from the varying treatment under Ind AS 19, IAS 19 and AS 715 (US GAAP).
4	**Life Contingency related software**
	• Construct simple models in 'R' using standard Indian mortality tables. • Apply 'R' in longevity studies by taking sample data of joint and single lives and analysing the effect on a population's longevity. • Explain how 'R' could be applied for high intensity financial data e.g., using daily stock prices for volatility estimates and efficient markets hypothesis testing. • Use 'R' to construct a term structure of interest rates.

References:

1. Actuarial Mathematics, Bowers, L. Newton, et. al. 2nd ISBN 0938959468, Society of Actuaries
2. Survival models and their estimation 1988 Actex Publications
3. Mathematics of Finance 2nd Edition Schaum's Outline Series Peter Zima, Robert Brows Tata McGraw-Hill Publishing Company Ltd.
4. Mortality Studies, WF Scott 2000 available at https://www.coursehero.com/file/8346708/Mortality-Studies-WF-Scott/
5. Life Contingencies by Alistair Neill, Institute of Actuaries Textbook, ISBN 978-0750609173,
6. published by Butterworth-Heinemann Ltd
7. Modelling, analysis, design, and control of stochastic systems, by Kulkarni, Vidyadhar G. Springer
8. Life Contingencies by E. P. Spurgeon ISBN 1107648092, Cambridge University Press.
9. Practical Data Science with R, Nina Zumel and John Mount
10. Data Mining Applications with R, Yanchang Zhao; Yonghua Cen
11. R for Everyone: Advanced Analytics and Graphics, Jared P. Lander
12. Statistics Using R by Purohit, Gore and Deshmukh, 2008, Narosa Publications
13. Actuarial Statistics- An Introduction Using R, Shailaja R Deshmuk

Teaching Pedagogy

Practical exposure of using software in FinTech Lab, Presentations and Problem solving.

Cumulative Continuous Assessment (CCA)

Method of evaluation	**Marks**
Assignment I	20
Assignment II	20
TOTAL	**40**

Paper pattern for written test of 60 Marks
SEMESTER IV

Question No.	**Particulars**		**Marks per Question**	**Total marks**
Q.1 (Unit I)	**Attempt any 3 out of 4 questions**		5	15
	A	Numerical / Theory/ Concept based Question		
	B	Numerical / Theory/ Concept based Question		
	C	Numerical / Theory/ Concept based Question		
	D	Numerical / Theory/ Concept based Question		
Q.2 (Unit II)	**Attempt any 3 out of 4 questions**		5	15
	A	Numerical / Theory/ Concept based Question		
	B	Numerical / Theory/ Concept based Question		
	C	Numerical / Theory/ Concept based Question		
	D	Numerical / Theory/ Concept based Question		
Q.3 (Unit III)	**Attempt any 3 out of 4 questions**		5	15
	A	Numerical / Theory/ Concept based Question		
	B	Numerical / Theory/ Concept based Question		
	C	Numerical / Theory/ Concept based Question		
	D	Numerical / Theory/ Concept based Question		
Q.4 (Unit IV)	**Attempt any 3 out of 4 questions**		5	15
	A	Numerical / Theory/ Concept based Question		
	B	Numerical / Theory/ Concept based Question		
	C	Numerical / Theory/ Concept based Question		
	D	Numerical / Theory/ Concept based Question		
TOTAL				**60**

Syllabus of courses of S.Y.B.Com (Actuarial Studies)
Academic Year 2023-2024
Elective Courses (EC)
Semester IV
Course Code 30402
Auditing (Techniques of Auditing and Audit Procedures) - Paper II
(3 Credits)

Instructional Objectives

- To make the learners understand the Financial Report framework.
- To make them understand general audit consideration, audit planning and audit of risk factors.
- To make them familiar with the provisions of IFRS and GAAP.
- To sensitize the learners with the duties and responsibilities of Auditor (Internal and External).

Learning Outcomes:

- The learner gets to know the special features of preparing an audit report.
- They get trained to look out for risk factors.
- They understand and apply the provision of International Rules and Regulations.
- They able to grasp and identifying financial frauds.

Modules at a Glance

Auditing (Techniques of Auditing and Audit Procedures) - Paper II		
Sr. No.	**Modules**	**No. of Lectures**
1	Financial Reporting Framework	15
2	Audit Consideration Chart	15
3	IFRS and GAAP	15
4	Application of statistical models to auditing	15
	Total No. of Lectures:	**60**

Sr. No.	Modules
I	**Financial Reporting Framework**
	● IRDAI preparation of Financial Statement and Auditors' Report in Insurance Companies (Regulation). ● Internal Control Mechanism. ● Revenue Recognition – Reserve Mechanism – Assessment of Risk. ● Identifying the mis-statements leading to frauds and collecting information about the same.
II	**Audit Consideration Chart**
	● Scope of Audit Engagement – General Consideration, Audit Planning – Audit of Risk Factor. ● Identification of adverse financial conditions – communication with the Management and Finance Committee. ● Reporting of Long-Term Liabilities in Insurance Companies – Liabilities for Future Policy benefits and Other Contract Liabilities. ● Listing fraud risk factors in BFSI and Practice of Professional Skepticism.
III	**IFRS and GAAP**
	● Statutory Accounting Principles governing insurance companies in India. ● GAAP – select provisions such as Audit Procedure, Audit Consideration Chart. ● IFRS – select provisions. ● Taxation of insurance entities in India. ● Regulation of Premium Rate, Tax on Premium and Accounting Practices.
IV	**Application of statistical models to auditing**
	● Principal components analysis. ● Cluster analysis (using live cases).

References:

1. Alvin A. Arens , Randal J. Elder, et al., Auditing and Assurance Services (16th Edition) Feb 1, 2016
2. Karla M Johnstone-Zehms, Audrey A., Auditing: A Risk Based-Approach by Gramling, et al. | Feb 14, 2018
3. Timothy Louwers, Allen Blay, et al, Auditing & Assurance Services (Auditing and Assurance Services) Feb 10, 2017)
4. Ray Whittington and Kurt Pany GEN COMBO LL PRINCIPLES OF AUDITING & OTHER ASSURANCE SERVICES; CONNECT AC , May 4, 2018
5. Jones Orumwense, Principles and Practice of Internal Auditing in the Banking Industry: A Training Guide in internal and Forensic Auditing in Banks and other financial institutions, Feb 26, 2013
6. AICPA, Audit and Accounting Guide - Depository and Lending Institutions: Banks and Savings Institutions, Credit Unions, Finance Companies, and Mortgage Companies (AICPA Audit and Accounting Guide) Oct 23, 2018

Teaching Pedagogy

Presentations, Discussions on reported negligence and Financial frauds.

Cumulative Continuous Assessment (CCA)

Method of evaluation	**Marks**
Assignment	20
Class Test	15
Class Participation & attendance	5
TOTAL	**40**

SEMESTER END EXAMINATION

Duration: 2 Hours

Question No.	**Particulars**		**Marks per Question**	**Total marks**
Q.1 (Unit I)	**Attempt any 3 out of 4 questions**		5	15
	A	Numerical / Theory/ Concept based Question		
	B	Numerical / Theory/ Concept based Question		
	C	Numerical / Theory/ Concept based Question		
	D	Numerical / Theory/ Concept based Question		
Q.2 (Unit II)	**Attempt any 3 out of 4 questions**		5	15
	A	Numerical / Theory/ Concept based Question		
	B	Numerical / Theory/ Concept based Question		
	C	Numerical / Theory/ Concept based Question		
	D	Numerical / Theory/ Concept based Question		
Q.3 (Unit III)	**Attempt any 3 out of 4 questions**		5	15
	A	Numerical / Theory/ Concept based Question		
	B	Numerical / Theory/ Concept based Question		
	C	Numerical / Theory/ Concept based Question		
	D	Numerical / Theory/ Concept based Question		
Q.4 (Unit IV)	**Attempt any 3 out of 4 questions**		5	15
	A	Numerical / Theory/ Concept based Question		
	B	Numerical / Theory/ Concept based Question		
	C	Numerical / Theory/ Concept based Question		
	D	Numerical / Theory/ Concept based Question		
TOTAL				**60**

Syllabus of courses of S.Y.B.Com (Actuarial Studies)
Academic Year 2023-2024
Ability Enhancement Courses (AEC)
Semester IV
Course Code 30403
Information Technology in Insurance Sector – Paper II (3 Credits)

Instructional Objectives:

- To make the learner understand the growing importance of IT in Insurance to manage claims and risk transfer.
- To appreciate the relevance of technology in client interface.
- To make them understand the risks in data management and the need for cyber security.
- To introduce emerging technology related to insurance business.

Learning Outcomes:

- The learner recognizes the role of IT in managing insurance space in India.
- They become aware of the need to simplify the client interface with the help of technology.
- The learner appreciates the need for robust cyber security measures.
- The learner gets encouraged to be futuristic by using technology.

Modules at a Glance

Information Technology in Insurance Sector – Paper II		
Sr. No.	**Modules**	**No. of Lectures**
1	Role of Information Technology in Life Insurance	15
2	Role of Information Technology in General Insurance	15
3	Integrated Grievance Management System (IGMS)	15
4	Future of Information Technology and Insurance Sector - TRAMBID, R Programming	15
	Total No. of Lectures:	**60**

Sr. No.	Modules
I	**Role of Information Technology in Life Insurance**
	• Policy Administration System • Claims Management • Re-insurance and Risk Transfer • Financial Accounting System
II	**Role of Information Technology in General Insurance**
	• Front Office Online System • Policy Management • Reinsurance and Claims Accounting • Report Generation
III	**Integrated Grievance Management System (IGMS)**
	• Legacy Data • Data Security, Cyber Security • Grievance Redressal System • Investment System Challenges • IT challenges in Mergers and Acquisitions
IV	**Future of Information Technology and Insurance Sector – TRAMBID, R Programming**
	• Telematics and Robotics • Artificial Intelligence and Machine Learning: Decision Trees, Cluster Analysis • Block chain • Internet of Things and Data Analytics • System Hacking • R Programming

References:

1. E-Banking in India : Challenges and Opportunities – By Rimpi Jatana, R. K. Uppal
2. Frontiers of E-Commerce – by Ravi Kalakota, Andrew B.Whinston – Pearson Education
3. Frontiers of E-Commerce – by Ravi Kalakota, Andrew B. Whinston – Pearson Education
4. Microsoft Office Professional 2013-Step by stepl by step
5. By Beth Melton, Mark Dodge, Echo Swinford, Andrew Couch
6. An Overview of Cyber Crime and Security – Volume 1-1st Edition by Akash Kamal Mishra
7. Computers and Banking by Sony and Agarwal
8. E-Commerce by David Whitely
9. Sanjay Soni and Vinayak Aggarwal, Computers and Banking, M/s Sultan Chand and sons, New Delhi, 1993.
10. Uppal, R. K. "E-Banking in India (challenges & Opportunities)", New Century
11. Publications, New Delhi, 2007.
12. General Bank Management from Indian Institute of Banking and Finance by Macmillan
13. Modern Banking Technology-by Firdos Temurasp Shroff – published by – Northern Book Center, New Delhi
14. General Bank Management from Indian Institute of Banking and Fiance by Macmillan
15. Microsoft Office Professional 2013-Step by step
16. By Beth Melton, Mark Dodge, Echo Swinford, Andrew Couch

Teaching Pedagogy

Use of technology, Group discussions, Case study analysis, Flip class, Quiz would be conducted in the class to make learning an enjoyable experience.

Cumulative Continuous Assessment (CCA)

Method of evaluation	**Marks**
Project using R programming	35
Class Participation & attendance	5
TOTAL	**40**

SEMESTER END EXAMINATION

Duration: 2 Hours

Question No.	**Particulars**		**Marks per Question**	**Total marks**
Q.1 (Unit I)	**Attempt any 3 out of 4 questions**		5	15
	A	Numerical / Theory/ Concept based Question		
	B	Numerical / Theory/ Concept based Question		
	C	Numerical / Theory/ Concept based Question		
	D	Numerical / Theory/ Concept based Question		
Q.2 (Unit II)	**Attempt any 3 out of 4 questions**		5	15
	A	Numerical / Theory/ Concept based Question		
	B	Numerical / Theory/ Concept based Question		
	C	Numerical / Theory/ Concept based Question		
	D	Numerical / Theory/ Concept based Question		
Q.3 (Unit III)	**Attempt any 3 out of 4 questions**		5	15
	A	Numerical / Theory/ Concept based Question		
	B	Numerical / Theory/ Concept based Question		
	C	Numerical / Theory/ Concept based Question		
	D	Numerical / Theory/ Concept based Question		
Q.4 (Unit IV)	**Attempt any 3 out of 4 questions**		5	15
	A	Numerical / Theory/ Concept based Question		
	B	Numerical / Theory/ Concept based Question		
	C	Numerical / Theory/ Concept based Question		
	D	Numerical / Theory/ Concept based Question		
TOTAL				**60**

Syllabus of courses of S.Y.B.Com (Actuarial Studies)
Academic Year 2023-2024
Ability Enhancement Courses (AEC)
Semester IV
Course Code 30404
Documentation Analysis and Reporting - Paper II (2 Credits)

Instructional Objectives:

- Learners develop analytical skill, appreciate the rendering of collected data and information in structured manner.
- They acquire skills of arranging and sequencing the subject matter.
- They acquire skills for interpretation of data and information.
- They identify the words and terminologies used in the report.

Learning Outcomes:

- The learners are able to analyse the information in the IRDAI annual report.
- They acquire knowledge required to arrange the subject matter in the report.
- They are enabled to form an opinion and express it verbally.
- They gain adequate vocabulary for professional report writing.

The recommended report is RBI Ombudsman Schemes, Annual Report and IRDAI Annual Report.

Modalities

1. All the learners will have to read the report.
2. The faculty will engage the learners based on the coverage of the modules.
3. There shall be group discussion, question answer sessions and idea generation.
4. There shall be a class test for 20 marks on the art of report writing in general and nuances of organizing a research report. This will purely evaluate the skills in report writing including language proficiency and expression.
5. The learners have to interpret at least four statistical tables (randomly picked by the faculty) and submit a report for 20 marks.
6. There shall be a Semester End Examination for 60 marks where the content of the report shall be tested. The examination will be an 'open book examination'.
7. The paper pattern for the same shall be four questions 15 marks each. There is no specification about the allocation of questions based on sequence of the report.
8. The passing minimum is common as applicable to other courses.

References:

1. IRDAI English Annual Report
2. Banking Ombudsman Report
3. Nestle India Annual Report

Teaching Pedagogy

Use of technology, Analysis of report, Group discussions, case study analysis.

Cumulative Continuous Assessment (CCA)

Method of evaluation	Marks
Statistical Table Analysis	20
Class Test	15
Attendance & Class Participation	5
TOTAL	**40**

SEMESTER END EXAMINATION

Duration: 2 Hours

Question No.		Particulars	Marks per Question	Total marks
Q.1 (Unit I)	**Attempt any 3 out of 4 questions**		5	15
	A	Numerical / Theory/ Concept based Question		
	B	Numerical / Theory/ Concept based Question		
	C	Numerical / Theory/ Concept based Question		
	D	Numerical / Theory/ Concept based Question		
Q.2 (Unit II)	**Attempt any 3 out of 4 questions**		5	15
	A	Numerical / Theory/ Concept based Question		
	B	Numerical / Theory/ Concept based Question		
	C	Numerical / Theory/ Concept based Question		
	D	Numerical / Theory/ Concept based Question		
Q.3 (Unit III)	**Attempt any 3 out of 4 questions**		5	15
	A	Numerical / Theory/ Concept based Question		
	B	Numerical / Theory/ Concept based Question		
	C	Numerical / Theory/ Concept based Question		
	D	Numerical / Theory/ Concept based Question		
Q.4 (Unit IV)	**Attempt any 3 out of 4 questions**		5	15
	A	Numerical / Theory/ Concept based Question		
	B	Numerical / Theory/ Concept based Question		
	C	Numerical / Theory/ Concept based Question		
	D	Numerical / Theory/ Concept based Question		
TOTAL				**60**

Syllabus of courses of S.Y.B.Com (Actuarial Studies)

Academic Year 2023-2024
Core Courses (CC)
Semester IV
Course Code 30405
Production and Finance (3 Credits)

Instructional Objectives:

- To get them introduced to few aspects of production and quality management.
- To acquaint the learners with the basic concepts of Production Management, Inventory Management &Quality Management.
- To impart the basic orientation towards the institutional framework of the Indian Financial System.
- To update the learners with the different markets and its players in the Indian Financial System and their relevance to India's Economy and also to orient them on how to invest in these financial markets.

Learning Outcomes:

- The learners are expected to understand the production process of industries and the inventory control techniques followed by them.
- They are expected to know the various Quality Management processes and techniques adopted by companies.
- Learners identify alternate sources of finance with special reference to micro finance.
- They acquire expertise in personal finance management.

Modules at a Glance

Production and Finance		
Sr. No.	**Modules**	**No. of Lectures**
1	Production Quality Management	15
2	Pension Plans and retirement benefits	15
3	Indian Financial System-I Institutional Framework	15
4	Indian Financial System-II Markets and Players- Institutions and Individuals	15
	Total No. of Lectures:	**60**

Sr. No.	Modules
I	**Production Quality Management**
	• **Introduction to Quality:** Dimensions of Quality. • **Cost of Quality:** Types – Internal Failure Cost, External Failure Cost, Appraisal Cost and Prevention Cost. • **Quality Circle**: Features. • **Quality Management Tools:** TQM – Importance, Six Sigma – Process, ISO 9000 Kaizen – Process. • Statistical tools for production quality measurement • Experience analysis of production outcome
II	**Pension Plans and retirement benefits**
	• Contribution and benefits of pension plans • Retiree health care plans • Decrements for pension plans, Markov chain models • Calculation and interpretation of replacement ratio, accrued benefits and their expected values. • Calculation and Interpretation of actuarial accrued liability and the cost for a plan under projected unit credit (PUC)cost method and traditional unit credit (TUC) cost method • Valuation assumptions: Mortality, Discrete salary increase changes.
III	**Indian Financial System-I Institutional Framework**
	• **Structure of Indian Financial Market** • **Financial Institutions**: (Banking and Non-Banking), Role of Financial Institutions in a developing country like India. • **Financial Markets**: Money market and its Instruments, Capital Market and its Participants. • **Stock Exchange and Commodity Exchange**: Functions. • **Regulatory and Promotional Institutions**: Understanding the Role of RBI, SEBI, IRDA, PFRDA. • **Depositories in India**: Role & Functions
IV	**Indian Financial System-II** **Markets and Players - Institutions and Individuals**

	• **Credit Rating Agencies** in India - CRISIL, CARE, and ICRA and CIBIL. **Alternative sources of finance:** • **Mutual Funds:** Factors responsible for growth of mutual funds, related risks- Systematic Investment Plan. • **Commodity Market and Commodity Boards:** Concept and relevance in Indian Market. • **Derivatives Market**: Meaning and Risks. • **Bond Market**: Concepts and Types, CCIL services e.g., ZCYC curve • **Micro Finance** – Importance, Role of Self-Help Groups. • **Personal finance** – Preparing Individual Savings, Investment and Pension (NPS) Plans.

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Teaching Pedagogy

Presentation, Practical work, Personal finance experiential learning.

Cumulative Continuous Assessment (CCA)

Method of evaluation	**Marks**
Power Point presentation	20
Class Test	15
Class Participation & attendance	5
TOTAL	**40**

SEMESTER END EXAMINATION
Duration: 2 Hours

Question No.	**Particulars**		**Marks per Question**	**Total marks**
Q.1 (Unit I)	**Attempt any 3 out of 4 questions**		5	15
	A	Numerical / Theory/ Concept based Question		
	B	Numerical / Theory/ Concept based Question		
	C	Numerical / Theory/ Concept based Question		
	D	Numerical / Theory/ Concept based Question		
Q.2 (Unit II)	**Attempt any 3 out of 4 questions**		5	15
	A	Numerical / Theory/ Concept based Question		
	B	Numerical / Theory/ Concept based Question		
	C	Numerical / Theory/ Concept based Question		
	D	Numerical / Theory/ Concept based Question		
Q.3 (Unit III)	**Attempt any 3 out of 4 questions**		5	15
	A	Numerical / Theory/ Concept based Question		
	B	Numerical / Theory/ Concept based Question		
	C	Numerical / Theory/ Concept based Question		
	D	Numerical / Theory/ Concept based Question		
Q.4 (Unit IV)	**Attempt any 3 out of 4 questions**		5	15
	A	Numerical / Theory/ Concept based Question		
	B	Numerical / Theory/ Concept based Question		
	C	Numerical / Theory/ Concept based Question		
	D	Numerical / Theory/ Concept based Question		
TOTAL				**60**

Syllabus of courses of S.Y.B.Com (Actuarial Studies)
Academic Year 2023-2024
Core Courses (CC)
Semester IV
Course Code 30406
Insurance Business Regulation and Supervision (3 Credits)

Instructional Objectives:

- To make the learner understand the provisions of various insurance specific laws.
- To make them appreciate the role of IRDAI with respect to insurance industry.
- To enable the learners to understand the need for Fire, Marine and Motor Insurance in India.
- To make the learner aware about the role of intermediaries and the legal regulation related to them.

Learning Outcomes:

- The learners understand the role of IRDAI as a regulatory body with respect to General Insurance Business in India.
- They know the current status of Fire, Marine and Motor Insurance in India.
- Learners analyse the present position of general insurance in India and the future prospects.
- Learners are motivated to explore the possibility of becoming an intermediary in insurance business.

Modules at a Glance

Business Laws and Insurance Specific Laws		
Sr. No.	**Modules**	**No. of Lectures**
1	Life Insurance and Health Insurance	15
2	General Insurance – I	15
3	General Insurance – II	15
4	Regulation of Intermediaries in the Insurance Industry	15
	Total No. of Lectures	**60**

Sr. No.	Modules
I	**Life Insurance and Health Insurance**
	• Status of Life and Health Insurance in India • IRDAI Life Insurance/ Re-insurance 2013 • IRDAI Assets liabilities and solvency of Life Insurance Business, 2013 • IRDAI Expenses of Management of Insurers transaction, Life insurance Business, 2016 • IRDAI Health Insurance Regulation, 2016 • IRDAI Third Party Administrators- Health Services, 2016 • IRDAI Actuarial Report & Abstract for Life Insurance Business, 2016
II	**General Insurance – I**
	• Need and Status of General Insurance in India • IRDAI General Insurance/ Re-insurance, 2016 • IRDAI Asset Liability and Solvency of General Insurance Business, 2016 • IRDAI Expenses of Management of Insurance transactions General / Health Insurance Business, 2016 • IRDAI (Issuers of Capital by Indian Insurance Company other than Life Insurance Business) Regulation 2015 • IRDAI General Insurance/ Re-insurance, 2018
III	**General Insurance – II**
	• Need and Status of Fire Insurance, Marine Insurance and Motor Insurance in India • Fire Insurance Act, (Current, as amended) • Marine Insurance Act, (Current, as amended) • Motor Insurance Act (Current, as amended) • IRDAI Obligations of Insurer in respect of Third party Insurance Business 2016
IV	**Regulation of Intermediaries in the Insurance Industry**
	• IRDAI Linked Insurance Products, 2013 • IRDAI Non Linked Insurance Products, 2013 • IRDAI Licensing of Banks as Insurance Brokers, 2013 • IRDAI Insurance Web Aggregators, 2017 • IRDAI Registration of Insurance Marketing Firms, 2016 • IRDAI Insurance Brokers, 2018 • IRDAI Licensing of Corporates , 2002 • IRDAI Protection of Policy Holders Interest, 2017 • IRDAI Obligation of Insurance to Rural Sectors, 2015 • IRDAI Micro Insurance Regulations, 2015

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4 IRDAI Reinsurance Regulations, 2018 https://www.irdai.gov.in/ADMINCMS/cms/frmGeneral_Layout.aspx?page=PageNo3685&flag=1

5 IRDAI Assets, Liabilities and Solvency Margin of Life Insurance Business, 2016 https://www.irdai.gov.in/ADMINCMS/cms/frmGeneral_Layout.aspx?page=PageNo2847&flag=1

6 IRDAI Assets, Liabilities and Solvency Margin of General Insurance Business, 2016 https://www.irdai.gov.in/ADMINCMS/cms/frmGeneral_Layout.aspx?page=PageNo2845&flag=1

7 IRDAI Expenses of Management of Insurers Transacting Life Insurance Business, 2016 https://www.irdai.gov.in/ADMINCMS/cms/frmGeneral_Layout.aspx?page=PageNo2864&flag=1

8 IRDAI Expenses of Management of Insurers Transacting General or Health Insurance Business, 2016 https://www.irdai.gov.in/ADMINCMS/cms/frmGeneral_Layout.aspx?page=PageNo2850&flag=1

9 IRDAI Preparation of Financial Statements and Auditor's Report of Insurance Companies, 2002 https://www.irdai.gov.in/ADMINCMS/cms/frmGeneral_Layout.aspx?page=PageNo3632&flag=1

Teaching Pedagogy

Analysis of various laws, Role play, Group Discussions, Presentation.

Cumulative Continuous Assessment (CCA)

Method of evaluation	**Marks**
Role Play	20
Class Test	15
Class Participation & attendance	5
TOTAL	**40**

SEMESTER END EXAMINATION
Duration: 2 Hours

Question No.	**Particulars**		**Marks per Question**	**Total marks**
Q.1 (Unit I)	**Attempt any 3 out of 4 questions**		5	15
	A	Numerical / Theory/ Concept based Question		
	B	Numerical / Theory/ Concept based Question		
	C	Numerical / Theory/ Concept based Question		
	D	Numerical / Theory/ Concept based Question		
Q.2 (Unit II)	**Attempt any 3 out of 4 questions**		5	15
	A	Numerical / Theory/ Concept based Question		
	B	Numerical / Theory/ Concept based Question		
	C	Numerical / Theory/ Concept based Question		
	D	Numerical / Theory/ Concept based Question		
Q.3 (Unit III)	**Attempt any 3 out of 4 questions**		5	15
	A	Numerical / Theory/ Concept based Question		
	B	Numerical / Theory/ Concept based Question		
	C	Numerical / Theory/ Concept based Question		
	D	Numerical / Theory/ Concept based Question		
Q.4 (Unit IV)	**Attempt any 3 out of 4 questions**		5	15
	A	Numerical / Theory/ Concept based Question		
	B	Numerical / Theory/ Concept based Question		
	C	Numerical / Theory/ Concept based Question		
	D	Numerical / Theory/ Concept based Question		
TOTAL				**60**

Syllabus of courses of S.Y.B.Com (Actuarial Studies)
Academic Year 2023-2024
Core Courses (CC)
Semester IV
Course Code 30407
Mathematical Modeling (Survival Models & Stochastic Models)
Paper II
(3 Credits)

Instructional Objective:

- To provide basic knowledge in the mathematical & statistical techniques which can be used to model and value cash flows dependent on death, survival, or other uncertain risks arising in pensions and life.
- To facilitate the learners to understand the application of actuarial modeling.
- To impart knowledge about annuity contracts.
- To make learners use data sets and understand the applications related to stochastic models.

Learning Outcomes:

- Learners acquire skills related to predictability using models.
- Learners become amenable to use stochastic process by identifying their role.
- They become critical analysts with reference to the use of models.
- They use the models.

Modules at a Glance

Mathematical Modeling (Survival Models & Stochastic Models)-Paper II		
Sr. No.	**Modules**	**No. of Lectures**
1	Time Series	15
2	Actuarial Modeling	15
3	Markov Chain Processes and Markov Jump Processes	15
4	Simple Assurance & Annuity Contracts	15
	Total No. of Lectures:	**60**

Sr. No.	Modules
I	**Time Series**
	• **Time Series:** Concepts and components of stochastic time series processes including random walks, stationarity and autocorrelation. • **Specific time series model:** Exponential smoothing, autoregressive and autoregressive conditionally heteroskedastic models. • **Calculation and interpretation of predicted values and confidence interval** • Representation of trend by Freehand Curve Method, Estimation of Trend using Moving Average Method and Least Squares Method (Linear Trend only). Estimation of Seasonal Component using Simple Arithmetic Mean for Additive Model and Multiplicative Model (For Trend free data only). Concept of Forecasting using Least Squares Method. and predicted values with confidence intervals
II	**Actuarial Modeling**
	• **Actuarial Modeling:** The principles of Actuarial modeling; Reasons and techniques of using actuarial models; Benefits and limitations of modeling; Difference between a stochastic and deterministic model, its advantages and disadvantages; Suitability of a model for any particular application; Difference between the short run and long run properties of a model; Analysis of potential output from a model and choice of model; Process of sensitivity testing of assumptions and its importance; Factors in communicating the results of the application of a model. supervised versus unsupervised learning and regression versus classification, assessing model accuracy, exploratory data analysis, including data checking and validation. • **Stochastic Processes:** Definition of stochastic process and counting process; The general principles of stochastic processes, classification of stochastic processes, Stochastic interest rate models; Stochastic process in continuous or discrete time; continuous or a discrete state space and in mixed type; Application of mixed processes; Meaning of Markov Property in the context of a stochastic process; Concept of stochastic interest rate model and distinction between this and a deterministic model; Algebraically derivation of annual rates of return.
III	**Markov Chain Processes and Markov Jump Processes**
	• **Markov Chain Processes:** Features of a time homogeneous Markov chain model; Calculation of the stationary distribution for a Markov chain model in simple cases; System of frequency based experience rating in terms of a Markov chain model and simple applications; Use of Markov chains as a tool for modeling; The Markov

	Processes; Poisson process, two state survival model, sickness models and examples, ● **Markov jump process**: Model and application. Markov jump processes as a tool for modeling. The random life time survival model: Consistency condition between the random variable representing lifetimes from different ages; random future lifetime, the survival function, the force of mortality or hazard rate, and their relationships; Definitions of the actuarial symbols and integral formulae; curtate future lifetime and the probability function; comparison of the random lifetime survival model with the two state Markov jump process survival model
IV	**Simple Assurance & Annuity Contracts**
	● Simple assurance contracts, formulae for the mean and variance of the present value of payments, (assuming deterministic interest), Definition: whole life assurance, Term assurance, Pure endowment, Endowment assurance, Deferred Whole Life and Deferred Term Assurance, relevant probabilities with their select equivalents, Determination of expressions in the form of sums for the expected present value of benefit payments under each of the above contracts, assuming that death benefits are payable at the end of the year of death. ● Simplification of these expressions, Application of the annuity factors, Different types of mortality table and their use including ways in which future improvements can be allowed for Life table functions and their select equivalents, Definition of life table. ● Probabilities.

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Teaching Pedagogy

Practical's in FinTech Lab, Problem solving and Presentation.

Cumulative Continuous Assessment (CCA)

Method of evaluation	**Marks**
Tutorial Test I	15
Tutorial Test II	20
Class participation	5
TOTAL	**40**

SEMESTER END EXAMINATION

Duration: 2 Hours

Question No.	Particulars		Marks per Question	Total marks
Q.1 (Unit I)	**Attempt any 3 out of 4 questions**		5	15
	A	Numerical / Theory/ Concept based Question		
	B	Numerical / Theory/ Concept based Question		
	C	Numerical / Theory/ Concept based Question		
	D	Numerical / Theory/ Concept based Question		
Q.2 (Unit II)	**Attempt any 3 out of 4 questions**		5	15
	A	Numerical / Theory/ Concept based Question		
	B	Numerical / Theory/ Concept based Question		
	C	Numerical / Theory/ Concept based Question		
	D	Numerical / Theory/ Concept based Question		
Q.3 (Unit III)	**Attempt any 3 out of 4 questions**		5	15
	A	Numerical / Theory/ Concept based Question		
	B	Numerical / Theory/ Concept based Question		
	C	Numerical / Theory/ Concept based Question		
	D	Numerical / Theory/ Concept based Question		
Q.4 (Unit IV)	**Attempt any 3 out of 4 questions**		5	15
	A	Numerical / Theory/ Concept based Question		
	B	Numerical / Theory/ Concept based Question		
	C	Numerical / Theory/ Concept based Question		
	D	Numerical / Theory/ Concept based Question		
TOTAL				**60**