AC 10-03-2025

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 & IV)

Under Choice Based Credit System

Academic Year 2025-2026

Faculty of Commerce

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

Syllabus as per National Education Policy 2020
Course Structure
S.Y.B.COM (Actuarial Studies) (Level 4.5)

No. of Courses	Course Code	Semester III	Credits
1		**Major (08 credits)**	
1.A		**Discipline Specific Course**	
1.A.a		Financial Mathematics and Life Contingency	**04**
1.A.b		Financial Mathematics and Life Contingency with spreadsheet	**04**
2		**Minor (03 credits)**	
2.A.a		Principles of Marketing	**03**
3		**General Elective (GE)/ Open Elective (OE) (03 Credits)**	
3.A.a		Insurance specific Laws	**03**
4		**Vocational & Skill Enhancement Courses (VSEC) (03 credits)**	
4A		**Vocational Skill Course (VSC)**	
		Documentation, Analysis and Reporting	**04**
4.B		**Skill Enhancement Course (SEC)**	
4.B.a		-	
5		**Enhancement Course, Value Enhancement Course, Indian Knowledge System (04 credits)**	
5.A		**Ability Enhancement Course (AEC)**	
5.A.a		Linguistic Studies I	**02**
5.B		**Field Project / Apprenticeship / Community Engagement & Services**	
5.B.a		Foundation of Research Skills	**02**
TOTAL		**CUMULATIVE CREDITS**	**22**

Exit option at the end of first year (on completion of semester III and semester IV):

Under Graduate Diploma in Actuarial Studies will be awarded to a learner on fulfilment of the Following conditions:

1. The learner should have acquired 44 credits in Semester III and IV considered together.
2. The learner should acquire an additional 4 credits as per norms by completing recognized courses under the National Skill Qualification Framework (NSQF) such as course on computer concepts, an Entrepreneurial Development Course and Internship.

Bachelor of Commerce (B.Com with Actuarial Studies) Programme
Syllabus as per National Education Policy 2020
Course Structure
S.Y.B.COM (Actuarial Studies) (Level 4.5)

No. of Courses	Course Code	Semester IV	Credits
1		**Major (08 credits)**	
1.A		**Discipline Specific Course**	
1.A.a		Advanced Financial Mathematics - I	**04**
1.A.b		Advanced Financial Mathematics - II	**04**
2		**Minor (03 credits)**	
2.A.a		Auditing (Techniques of Auditing and Audit Procedure)	**03**
3		**General Elective (GE)/ Open Elective (OE) (03 Credits)**	
3.A.a		Business Management	**03**
4		**Vocational &Skill Enhancement Courses (VSEC) (03 credits)**	
4.A		**Vocational Skill Course (VSC)**	
4.A.a		Advanced Financial Mathematics with Spreadsheet	**04**
4.B		**Skill Enhancement Course (SEC)**	
4.B. a		-	
5		**Ability Enhancement Course, Value Enhancement Course, Indian Knowledge System (06 credits)**	
5.A		**Ability Enhancement Course (AEC)**	
5.A.a		Linguistic Studies II	**02**
5.B		**Field Project / Apprenticeship / Community Engagement & Services**	
5.B.a		Project Work	**02**
TOTAL		**CUMULATIVE CREDITS**	**22**

Exit option at the end of first year (on completion of semester III and semester IV):

Under Graduate Diploma in Actuarial Studies will be awarded to a learner on fulfilment of the Following conditions:

1. The learner should have acquired 44 credits in Semester III and IV considered together.
2. The learner should acquire an additional 4 credits as per norms by completing recognized courses under the National Skill Qualification Framework (NSQF) such as course on computer concepts, an Entrepreneurial Development Course and Internship.

Syllabus of courses of SY B. Com (Actuarial Studies) Programme

(With effect from the Academic Year 2025-2026)

1. Major (1.A.a Financial Mathematics and Life Contingency)

Financial Mathematics and Life Contingency (4 Credits)

Semester III

1. Major	
1.A Actuarial Studies – I	
1.A.b Financial Mathematics and Life Contingency	
Course Objectives and Course Outcomes	
Course Objectives	
CObj 1	Understand and apply equation of value principles to evaluate financial problems in particular relating to loan schedules, bond prices, bond yields and project appraisals.
CObj 2	The learners are made to understand the concept and is equipped to interpret mortality table.
CObj 3	The learners get introduced to the existing models related to mortality.
CObj 4	To enable the learners, acquire knowledge about projection with respect to cash flows in life insurance and pension schemes.
CObj 5	To enable the learners, acquire knowledge about projection with respect to profit testing in life insurance products.
Course Outcomes	
COut 1	The learner learns about Concept of share, face value, market value, dividend, equity shares, preferential shares, bonus shares, Rights issues
COut 2	The learner gets a fair idea about Debt instruments. Valuation and Portfolio Mix
COut 3	Learners apply the mortality analysis for insurance business
COut 4	Learners make use of various processes related to mortality.
COut 5	They are conversant with actuarial applications.
COut 6	The learner is able to project cash flows of contingent contracts.

Modules at a Glance

Financial Mathematics and Life Contingency		
Sr. No.	**Modules**	**No. of Lectures**
1	Loan Schedules, Bonds, Property and Equity	11
2	Project Appraisal and Term structure of interest rates	11
3	Gross premium, gross premium reserves and joint life	11
4	Profit testing	12
	Total No. of Lectures:	**45**

Sr. No.	Modules
1	**Loan Schedules, Bonds, Property and Equity**
	Use the concept of equation of value to solve various practical problems Apply the equation of value to loans repaid by regular instalments of interest and capital. Obtain repayments, interest and capital components, the effective interest rate (APR) and construct a schedule of repayments Calculate the price of, or yield (nominal or real allowing for inflation) from, a bond (fixed-interest or index-linked) where the investor is subject to deduction of income tax on coupon payments and redemption payments are subject to deduction of capital gains tax Calculate the running yield and the redemption yield for the financial instrument. Calculate the upper and lower bounds for the present value of the financial instrument. Calculate the present value or yield (nominal or real allowing for inflation) from an ordinary share or property, given constant or variable rate of growth of dividends or rents
2	**Project Appraisal and Term structure of interest rates**
	Apply cashflow and equation of value techniques to project appraisals. Calculate the net present value and accumulated profit of the receipts and payments from an investment project at given rates of interest Calculate the internal rate of return, payback period and discounted payback period and discuss their suitability for assessing the suitability of an investment project

	Demonstrate an understanding of the term structure of interest rates. Understand the main factors influencing the term structure of interest rates Understand and calculate: • Discrete spot rates and forward rates • Continuous spot rates and forward rates Understand and calculate the par yield and yield to maturity. Understand duration, convexity and immunisation of cashflows: Demonstrate how the duration and convexity of a cashflow sequence may be used to estimate the sensitivity of the value of the cashflow sequence to a shift in interest rates Understand, apply and discuss Redington's conditions for immunisation of a portfolio of liabilities
3	**Gross premium, gross premium reserves and joint life**
	Describe the operation of conventional with-profits contracts, in which profits are distributed by the use of regular reversionary bonuses, and by terminal bonuses. Describe the benefits payable under the above assurance-type contracts. Develop formulae for the means and variances of the payments under various assurance and annuity contracts, assuming constant deterministic interest rates. Define the gross random future loss under an insurance contract, and state the principle of equivalence. Describe and calculate gross premiums and reserves of assurance and annuity contracts. Define and calculate gross premiums and reserves for the insurance contract benefits under various scenarios using the equivalence principle or otherwise: • contracts may accept only single premium • regular premiums and annuity benefits may be payable annually, more frequently than annually, or continuously • death benefits (which increase or decrease by a constant compound rate or by a constant monetary amount) may be payable at the end of the year of death, or immediately on death survival benefits (other than annuities) may be payable at defined intervals other than at maturity. Define and calculate, for a single policy or a portfolio of policies (as appropriate): • death strain at risk • expected death strain • actual death strain • mortality profit Extend the techniques of single life annuities and assurance to deal with cashflows dependent upon the death or survival of either or both of two lives Extend the techniques of objectives previous module to deal with cashflows dependent upon the death or survival of either or both of two lives. Extend the technique to deal with functions dependent upon a fixed term as well as age.

4	**Profit testing**
	Project expected future cashflows for whole life, endowment and term assurances, annuities, unit-linked contracts, and conventional/unitised with-profits contracts, incorporating multiple decrement models as appropriate. Profit test life insurance contracts of the types listed above and determine the profit vector, the profit signature, the net present value and the profit margin. Show how a profit test can be used to price a product, and use a profit test to calculate a premium for life insurance contracts of the types listed above. Project expected future cashflows for whole life, endowment and term assurances, annuities, unit-linked contracts, and conventional/unitised with-profits contracts, incorporating multiple decrement models as appropriate. Show how, for unit-linked contracts, non-unit reserves can be established to eliminate ('zeroise') future negative cashflows, using a profit test model.

Financial Mathematics and Life Contingency

Question Paper Pattern (Academic Year: 2025-2026)

Internal Examination & Semester End Examination – 100 Marks

A] Internals-40 Marks

Allocation of 40 Marks---Internal evaluation

Method of evaluation	**Total marks**
Assignments	20
Written test	20
TOTAL	**40**

B] Semester End Examination (SEE)- 60 Marks

Maximum Marks 60

Duration : 2 Hours

Note: 1) All questions are compulsory

2)Figures to the right indicate full marks

Question No.	**Particulars (Nature of Questions)**	**Marks (Given)**	**Marks (To Be Attempted)**
Q-1	Attempt the following		
	A. Theory/Concept-based question B. Theory/Concept-based question C. Theory/Concept-based question D. Theory/Concept-based question	5 5 5 5	20
Q-2	Attempt the following		
	A. Theory/Concept-based question B. Theory/Concept-based question C. Theory/Concept-based question D. Theory/Concept-based question	5 5 5 5	20
Q-3	Attempt **any one** of the following		
	A. Attempt the following a. Theory/Concept-based question b. Theory/Concept-based question B. Theory/Concept-based question	 10 10 20	20
	Total	**80**	**60**

Reference Books

- Life assurance mathematics. Scott, W. F. Heriot-Watt University, 1999.
- Life contingencies. Neill, A. Heinemann, 1977
- Life insurance mathematics. 3rd ed. Gerber, H. U. Springer; Swiss Association of Actuaries, 1997.
- Mathematics of compound interest. Butcher, M. V.; Nesbitt, C. J. Ulrich's Books, 1971.
- Modern actuarial theory and practice. 2nd ed. Booth, P. M.; Chadburn, R. G.; Haberman, S. et al. Chapman & Hall, 2005.
- Theory of financial decision making. Ingersoll, J. E. Rowman & Littlefield, 1987.
- The theory of interest. 3rd ed. Kellison, S. G. McGraw-Hill-Irwin, 200

Syllabus of courses of SY B. Com (Actuarial Studies) Programme

(With effect from the Academic Year 2025-2026)

1. Major (1.A.b Financial Mathematics and Life Contingency with spreadsheet)

Financial Mathematics and Life Contingency with spreadsheet (4 Credits)

Semester III

1. Major	
1.A Actuarial Studies – I	
1.A.b Financial Mathematics and Life Contingency with spreadsheet	
Course Objectives and Course Outcomes	
Course Objectives	
CObj 1	Learn interest rates and annuities using financial mathematics
CObj 2	Understand financial models and use Excel to create the financial models
CObj 3	Describe and Learn Loans Schedules , Project financial appraisal and learn Bonds, property and equity.
CObj 4	Learn the term structures of interest rates, Redington's laws
CObj 5	Learn life assurances and annuities using Excel
CObj 6	Understand life insurance models and use Excel to create the models
CObj 7	Learn profit testing in life insurance products using Excel
CObj 8	Learn multiple decrement and joint life using Excel
Course Outcomes	
COut 1	The learner knows to describe the basic principles of actuarial modelling
COut 2	The learner is able to interpret and discuss the theories on interest rates
COut 3	The learner can evaluate , interpret and discuss mathematical techniques used in financial models
COut 4	The learner is aware of the use of Excel to create and calculate the financial models.
COut 5	The learner is aware of the use Excel Functions to appraise financial projects
COut 6	The learner is able to calculate price and yield of bonds using Excel functions.
COut 7	The learner is able to interpret and discuss life assurance and annuities.
COut 8	The learner can evaluate , interpret and discuss life insurance products
COut 9	The learner is aware of the use of Excel to create and calculate the models.

COut 10	The learner is aware of the use Excel Functions to profit test an life insurance product

Modules at a Glance

Financial Mathematics and Life Contingency with spreadsheet		
Sr. No.	**Modules**	**No. of Lectures**
1	Excel Application on annuities, loan schedule and project appraisal	11
2	Bond, property, equity and term structure	11
3	Life tables, assurance and annuity	11
4	Joint life, competing risks and profit testing	12
	Total No. of Lectures:	**45**

Sr. No.	Modules
1	**Excel Application on annuities, loan schedule and project appraisal**
	Explain Financial functions in Excel (DB,PV, FV, NPV, IRR, RATE, YIELD) Use Excel Functions to create annuities and increasing annuity. Show how change in interest rates may affect the present values and accumulated values of annuity and increasing annuity. Use Excel Functions to create loan schedules. Use loan schedules to find repayments, interest rates, loan outstanding, interest component and capital component. Solve sums where term of loan, interest rate changes. Solve sums where loan is rescheduled due to increase in loan amount. Use FRI and APR to solve sums. Use Excel Functions to appraise financial projects. Find NPV, IRR and DPP for the projected cashflows. Find surplus amount after loan has been repaid. Find accumulated profit.
2	**Bond, property, equity and term structure**
	Use Excel Functions to find price and yield of bonds. Solve sums with income tax and capital gain tax. Use Excel Functions to use Inflation Index for bond pricing. Show how inflation index can be used. Show money cashflows and real cashflows. Find money and real rates of return.

	Use Excel Functions to calculate price of property and equity in different valuation situations. Show term structure of interest rates. Discus how and why interest rates may change. Discus how this impacts the prices of bonds and securities. Find spot rates and forward rates. Use them to find the price and yields of a bond.
3	**Life tables, premium and reserves**
	Use of Life table functions and probability functions. Use uniform distribution of death and constant force of mortality to find probabilities between integer ages. Develop formulae for the means and variances of the payments under various assurance and annuity contracts, assuming constant deterministic interest rates. Define the gross random future loss under an insurance contract, and state the principle of equivalence. Describe and calculate gross premiums and reserves of assurance and annuity contracts. Define and calculate gross premiums and reserves for the insurance contract benefits under various scenarios using the equivalence principle.
4	**Joint life, competing risks and profit testing**
	Extend the techniques of single life annuities and assurance to deal with cashflows dependent upon the death or survival of either or both of two lives. Extend the techniques of objectives previous module to deal with cashflows dependent upon the death or survival of either or both of two lives. Extend the technique to deal with functions dependent upon a fixed term as well as age. Construct formulae for the expected present values of cashflows that are contingent upon multiple transition events, including simple health insurance premiums and benefits, and calculate these in simple cases. Regular premiums and sickness benefits are payable continuously and assurance benefits are payable immediately on transition. Project expected future cashflows for whole life, endowment and term assurances, annuities, unit-linked contracts, and conventional/unitised with-profits contracts, incorporating multiple decrement models as appropriate. Profit test life insurance contracts of the types listed above and determine the profit vector, the profit signature, the net present value and the profit margin. Project expected future cashflows for whole life, endowment and term assurances, annuities, unit-linked contracts, and conventional/unitised with-profits contracts, incorporating multiple decrement models as appropriate.

Financial Mathematics and Life Contingency with spreadsheet

Question Paper Pattern (Academic Year: 2025-2026)

Internal Examination & Semester End Examination – 100 Marks

A] Internals-40 Marks

Allocation of 40 Marks---Internal evaluation

Method of evaluation	**Total marks**
Assignments	20
Power Point Presentation and Group discussion	20
TOTAL	**40**

B] Semester End Examination (SEE)- 60 Marks

Maximum Marks 60

Duration : 2 Hours

Note: 1) All questions are compulsory

2)Figures to the right indicate full marks

Question No.	**Particulars (Nature of Questions)**	**Marks (Given)**	**Marks (To Be Attempted)**
Q-1	Attempt **any one** of the following		
	A. Concept-based question B. Concept-based question	10 10	10
Q-2	Attempt **any one** of the following		
	A. Concept-based question B. Concept-based question	10 10	10
Q-3	Attempt the following		
	Concept-based question	20	20
Q-4	Attempt the following		
	Concept-based question	20	20
	Total	**80**	**60**

Reference Books (with Chapters)

- Machine learning with R: expert techniques for predictive modeling to solve all your data analysis problems. 2nd ed. Lantz, B. - Packt Publishing, 2013.
- Modeling, analysis, design and control of stochastic systems. Kulkarni, V.G. - Springer, 1999.
- Modelling mortality with actuarial applications. Macdonald, A.S., Richards, S.J. and Currie, I.D. - Cambridge University Press, 2018.
- Mortality studies. Scott, W. F. - University of Aberdeen, Department of Mathematical Sciences, 2000.
- Non-life actuarial models: theory, methods and evaluation. Tse, Y-K. - Cambridge University Press, 2009.
- Probability and random processes. 3rd ed. Grimmett, G.; Stirzaker, D. - Oxford University Press, 2001.
- Practical risk theory for actuaries. Daykin, C. D.; Pentikainen, T.; Pesonen, M. - Chapman & Hall, 1994.
- Risk modelling in general insurance: from principles to practice. Gray, R.J.; Pitts, S.M. - Cambridge University Press, 2012.
- The statistical analysis of failure time data. 2nd ed. Kalbfleisch, J.D.; Prentice, R.L. - Wiley-Blackwell, 2002.
- Stochastic processes: an introduction. 2nd ed. Jones, P; Smith, P. Arnold. - Chapman & Hall, 2009.
- Survival models and data analysis. Elandt-Johnson, R. C.; Johnson, N. L. - John Wiley, 1999.

Syllabus of courses of SY B. Com (Actuarial Studies) Programme

(With effect from the Academic Year 2025-2026)

2. Minor (1.A.c Principles of Marketing)

Principles of Marketing

Semester II

1.Major	
1.A Actuarial Studies – I	
1.A.b Principles of Marketing	
Course Objectives and Course Outcomes	
Course Objectives	
CObj 1	To understand the place and contribution of marketing to the business enterprise.
CObj 2	To understand major bases for segmenting consumer and business markets; define and be able to apply steps of target marketing: market segmentation and market positioning
CObj 3	Identify the costs and benefits of marketing channels; discuss the firms and the functions involved in typical channels.
CObj 4	To Identify the roles of advertising, sales promotion, public relations, personal selling, and direct marketing in the promotion mix; compare and contrast integrated marketing communications with a non-integrated approach to the promotional mix
Course Outcomes	
COut 1	The marketing concentration is designed to prepare learners who are interested in a marketing and/or marketing management career.
COut 2	The learner understands fundamental marketing concepts of market and consumer behavior
COut 3	There is understanding of 4P’s of marketing.
COut 4	The learners are able to apply the knowledge, concepts, tools necessary to understand challenges and issues of marketing in a growing international and global context.
COut 5	The learners are able to appreciate the importance of cultural adaptation of international business and marketing through appraisal.
COut 6	The learner is able to critically analyze social, technological, political, legal and economic forces that affect business.
COut 7	The learners will be able to build valuable communication and negotiation skills
COut 8	The learner will be able to read and understand data that plays a crucial role in making strategic decisions in every field and industry
COut 9	The learner understands business principles along with the elements of psychology, sociology and even politics
COut 10	The learners develop essentials business insights

Modules at a Glance

Principles of Marketing		
Sr. No.	**Modules**	**No. of Lectures**
1	Introduction to Marketing	15
2	Marketing Environment, Research and Consumer Behaviour	15
3	Marketing Mix, Segmentation, Targeting and Positioning and Trends in Marketing	15
	Total No. of Lectures:	**45**

Sr. No.	Modules
1	**Introduction to Marketing**
	Introduction to Marketing: Definition, features, advantages and scope of marketing. The 4P's and 4C's of marketing. Marketing v/s Selling. Marketing as an activity and function •Concepts of Marketing: Needs, wants and demands, transactions, transfer and exchanges. • Orientations of a firm: Production concept; Product concept; sellingconcept and marketing concept, social relationship, Holistic marketing Functions of Marketing
2	**Marketing Environment, Research and Consumer Behavior**
	• Marketing research: Meaning, features, Importance of marketing research. Types of marketing research: Product research; Sales research; consumer/customer research; production research (Only overview to be provided) • MIS: Meaning, features and Importance Consumer Behavior: Meaning, feature, importance, factors affecting Consumer Behavior
3	**Marketing Mix, Segmentation, Targeting and Positioning and Trends in Marketing**
	Marketing mix: Meaning elements of Marketing Mix. • Product-product mix-product line life Cycle-product planning -levels of product. • Branding –Packing and packaging – role and importance • Pricing – objectives- factors influencing pricing policy and Pricing strategy. • Physical distribution – meaning – factor affecting channel selection-types of marketing channels • Promotion – meaning and significance of promotion. Promotion • tools(brief) 7P's of Marketing Segmentation – meaning, importance, basis • Targeting – meaning, types • Positioning – meaning – strategies • New trends in marketing. Artificial Intelligence, Virtual, Reality in consumer experience.

Principles of Marketing

Question Paper Pattern (Academic Year: 2023-2024)

Internal Examination & Semester End Examination – 100 Marks

A] Internals-40 Marks

Method of evaluation	**Marks**
Assignment	20
Power Point Presentation-Pre-set criteria	20
TOTAL	**40**

B] Semester End Examination (SEE)- 60 Marks

Maximum Marks 60

Duration : 2 Hours

NOTE: 1. All questions are compulsory.

2. All questions carry equal marks

Question No.	**Particulars (Nature of Questions)**	**Marks (Given)**	**Marks (To Be Attempted)**
Q-1	**Attempt Any 4**		
	A. Theory/Concept-based question B. Theory/Concept-based question C. Theory/Concept-based question D. Theory/Concept-based question E. Theory/Concept-based question	5 5 5 5 5	**20**
Q-2	**Attempt Any 4**		
	A. Theory/Concept-based question B. Theory/Concept-based question C. Theory/Concept-based question D. Theory/Concept-based question E. Theory/Concept-based question	5 5 5 5 5	**20**
Q-3	**Attempt Any 4**		
	A. Theory/Concept-based question B. Theory/Concept-based question C. Theory/Concept-based question D. Theory/Concept-based question E. Theory/Concept-based question	5 5 5 5 5	**20**
	Total	**75**	**60**

Reference Books (with Chapters):

- Kotlar, Philip, Marketing Management, Prentice Hall, New Delhi.
- Stanton, Etzel, Walker, Fundamentals of Marketing, Tata-McGraw Hill, New Delhi.
- Saxena, Rajan, Marketing Management, Tata-McGraw Hill, New Delhi.
- McCarthy, E.J., Basic Marketing: A managerial approach, Irwin, New York.
- Pillai R S, Bagavathi, Modern Marketing

Syllabus of courses of SY B. Com (Actuarial Studies) Programme

(With effect from the Academic Year 2025-2026)

3. General /Open Electives

General Electives (GE)/ Open Elective (OE)

Insurance specific Laws (3 Credits)

Semester III

3. General /Open Electives	
General Electives (GE)/ Open Elective (OE)	
3.A.a Insurance specific Laws	
Course Objectives and Course Outcomes	
Course Objectives	
CObj 1	To familiarize the learner with the various common Insurance specific laws applicable to insurance business.
CObj 2	To enable the learners in understanding the evolution of insurance laws.
CObj 3	To make the learner aware of the evolution and legal framework of insurance business in India.
CObj 4	To make them realize the need and importance of compliance
Course Outcomes	
COut 1	The learner becomes knowledgeable of the basic provisions of various business laws.
Cout 2	They are acquainted with the important changes made in the provisions of various business laws.
Cout 3	They appreciate the regulatory framework of insurance business in India.
Cout 4	The learners explores a career opportunity related to compliance.

Modules at a Glance

Insurance specific Laws		
Sr. No.	**Modules**	**No. of Lectures**
1	Evolution of Insurance Laws in India	15
2	Regulatory Framework of Insurance Business in India	15
3	Application of Insurance specific laws (Case study)	15
	Total No. of Lectures:	**45**

Sr. No.	Modules
1	**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
2	**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
3	**Application of Insurance specific laws (Case study)**
	● Case studies will be discussed in class to enable to apply the concept learnt in class

Insurance specific Laws

Question Paper Pattern (Academic Year: 2025-2026)

Internal Examination & Semester End Examination – 100 Marks

A] Internals-40 Marks

Allocation of 40 Marks---Internal evaluation

Method of evaluation	**Total marks**
Assignments	20
Power Point Presentation and Group discussion	20
TOTAL	**40**

B] Semester End Examination (SEE)- 60 Marks

Maximum Marks 60

Duration : 2 Hours

Note: 1) All questions are compulsory

2)Figures to the right indicate full marks

Question No.	**Particulars (Nature of Questions)**	**Marks (Given)**	**Marks (To Be Attempted)**
Q-1	Attempt **any three** of the following		
(Module-I)	A. Theory/Concept-based question B. Theory/Concept-based question C. Theory/Concept-based question D. Theory/Concept-based question	5 5 5 5	15
Q-2	Attempt **any three** of the following		
(Module-II)	A. Theory/Concept-based question B. Theory/Concept-based question C. Theory/Concept-based question D. Theory/Concept-based question	5 5 5 5	15
Q-3	Attempt **any three** of the following		
(Module-III)	A. Theory/Concept-based question B. Theory/Concept-based question C. Theory/Concept-based question D. Theory/Concept-based question	5 5 5 5	15
Q-4	Attempt **any three** of the following		
(Module-IV)	A. Theory/Concept-based question B. Theory/Concept-based question C. Theory/Concept-based question D. Theory/Concept-based question	5 5 5 5	15
	Total	**80**	**60**

Reference Books (with Chapters)

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

Syllabus of courses of SY B. Com (Actuarial Studies) Programme

(With effect from the Academic Year 2025-2026)

4. VSC (4.A.a Documentation, Analysis and Reporting)

Documentation, Analysis and Reporting (4 Credits)

Semester III

4. Vocational & Skill Enhancement Courses (VSEC)	
4.A Vocational Skill Courses (VSC)	
4.A.a Documentation, Analysis and Reporting	
Course Objectives and Course Outcomes	
Course Objectives	
CObj 1	To make them understand the nuances of report writing, segmenting the report, the nomenclature, technicalities and flow of the report.
CObj 2	To make them realise the need for an accepted format, alignment of different sections as well as sub- sections of the report.
CObj 3	To make the learner comprehend the use of tables, graphs and other presentation aids in the report at the appropriate places.
CObj 4	To enable them to become a rapid reader.
Course Outcomes	
COut 1	Learners develop analytical skill and appreciate the rendering of collected data and information in structured manner.
COut 2	They acquire skills of arranging and sequencing the subject matter.
COut 3	They acquire skills for interpretation of data and information.
COut 4	They acquire skills to form an opinion and express it with authenticity.

Modules at a Glance

Documentation, Analysis and Reporting		
Sr. No.	**Modules**	**No. of Lectures**
1	Overview of documentation analysis and reporting and IRDAI Annual Report	15
2	Discussion on tables and graphs – interpretation thereof	15
3	Nuances of interpretation and reporting	15
4	Overview of documentation analysis and reporting and RBI Annual Report	15
	Total No. of Lectures:	**60**

Sr. No.	Modules
1	**Overview of documentation analysis and reporting and IRDAI Annual Report**
	● Introduction to technical report reading & writing. ● Gathering the relevant information from the data. ● Introduction and understanding of an actual Report. ● Relevant fact analysis. ● Discarding the irrelevant data.
2	**Discussion on tables and graphs – interpretation thereof**
	● Ways of Data Tabulation. ● Graphical interpretation and inferences.
3	**Nuances of interpretation and reporting**
	● Comparing inferences from different data representations. ● Group discussions of different data techniques. ● Step by Step report writing and summary.
4	**Overview of documentation analysis and reporting and RBI Annual Report**
	• All the learners will have to read the report. • The faculty will engage the learners based on the coverage of the modules. • There shall be group discussion, question answer sessions and idea generation. • 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. • The learners have to interpret at least four statistical tables (randomly picked by the faculty) and submit a report for 20 marks. • 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’. • 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. • The passing minimum is common as applicable to other courses.

Documentation, Analysis and Reporting

Question Paper Pattern (Academic Year: 2025-2026)

Internal Examination & Semester End Examination – 100 Marks

A] Internals-40 Marks

Allocation of 40 Marks---Internal evaluation

Method of evaluation	**Total marks**
Assignments	20
Power Point Presentation and Group discussion	20
TOTAL	**40**

B] Semester End Examination (SEE)- 60 Marks

Maximum Marks 60

Duration : 2 Hours

Note: 1) All questions are compulsory

2)Figures to the right indicate full marks

Question No.	**Particulars (Nature of Questions)**	**Marks (Given)**	**Marks (To Be Attempted)**
Q-1	Attempt **any three** of the following		
(Module-I)	A. Theory/Concept-based question B. Theory/Concept-based question C. Theory/Concept-based question D. Theory/Concept-based question	5 5 5 5	15
Q-2	Attempt **any three** of the following		
(Module-II)	A. Theory/Concept-based question B. Theory/Concept-based question C. Theory/Concept-based question D. Theory/Concept-based question	5 5 5 5	15
Q-3	Attempt **any three** of the following		
(Module-III)	A. Theory/Concept-based question B. Theory/Concept-based question C. Theory/Concept-based question D. Theory/Concept-based question	5 5 5 5	15
Q-4	Attempt **any three** of the following		
(Module-IV)	A. Theory/Concept-based question B. Theory/Concept-based question C. Theory/Concept-based question D. Theory/Concept-based question	5 5 5 5	15
	Total	**80**	**60**

Reference Books (with Chapters)

IRDAI English Annual Report

Banking Ombudsman Report

Nestle India Annual Report

Syllabus of courses of SY B. Com (Actuarial Studies) Programme

(With effect from the Academic Year 2025-2026)

5. Ability Enhancement Courses, Value Enhancement Course, Indian Knowledge System

5.A Ability Enhancement Course (AEC)

5.A.a Linguistic Studies I (2 Credits)

Semester III

5. Ability Enhancement Courses, Value Enhancement Course, Indian Knowledge System	
5.A Ability Enhancement Course (AEC)	
5.A.a Linguistic Studies I	
Course Objectives and Course Outcomes	
Course Objectives	
CObj 1	To create curiosity in the minds of learns about the chosen language
CObj 2	To help the learners understand the need to learn the chosen language
CObj 3	To introduce learners to the structure of the chosen language
CObj 4	To understand the richness of Indian selected languages with reference to consonants and vowels
CObj 5	To understand unique characteristics of the chosen language
CObj 6	To understand the use of gender and tenses
CObj 7	To understand the use of idioms and phrases
CObj 8	To know the various dialects of the chosen language
CObj 9	To understand the application of technology for communication by alternatively abled
CObj 10	To understand the need of learning functional language
CObj 11	To get familiarized with the literature of the chosen language
CObj 12	To get familiarized with the literature translated to the chosen language from other languages
CObj 13	To learn to appreciate the other literary forms of the chosen language
Course Outcomes	
COut 1	The learner will be curious to learn the chosen language
COut 2	The leaner will be able to understand the need to learn the chosen language
COut 3	The learner will get familiar with the structure of the chosen language

COut 4	To understand the richness of Indian selected languages with reference to constants and vowels
COut 5	To understand unique characteristics of the chosen language
COut 6	To understand the use of gender and tenses
COut 7	To understand the use of idioms and phrases
COut 8	To know the various dialects of the chosen language
COut 9	To understand the application of technology for communication by alternatively abled
COut 10	To understand the need of learning functional language
Cout 11	To get familiarized with the literature of the chosen language
Cout 12	To get familiarized with the literature translated to the chosen language from other languages
Cout 13	To learn to appreciate the other literary forms of the chosen language

Modules at a Glance

Linguistic Studies I		
Sr. No.	**Modules**	**No. of Lectures**
1	Introduction to Linguistic Studies	10
2	Languages in Communication	10
3	Select Studies in the chosen Language (Any One) (Hindi/Marathi/Sanskrit)	10
	Total No. of Lectures:	**30**

Sr. No.	Modules
1	**Introduction to Linguistic Studies**
	• Structure of languages • English language compared with the select Indian languages – viz, Hindi, Marathi and Sanskrit • Richness of Indian languages with reference to Vowels, consonants (maatra) • Rhythmic characteristic of Indian languages. • Unique characteristics of language (such as Repeat words like Sarsarahat) • Logic behind numbers in regional languages • Use of Tenses and Gender
2	**Languages in Communication**
	• Use of Idioms and Phrases • Oral and Written • Dialects • Communication for alternatively abled • Use of Sign language • Language learning – Use of Technology • Need for learning functional language
3	**Select Studies in the chosen Language (Hindi/Marathi/Sanskrit)**
	The faculty member shall discuss with the learners about the richness of literature of chosen language. Subsequently the entire class will choose two authors and two poets. The chosen literary work needs to be read and discussed in the class. Based on this module, internal evaluation shall be done.

Linguistic Studies I

Question Paper Pattern (Academic Year: 2025-2026)

Internal Examination & Semester End Examination – 50 Marks

A] Internals-20 Marks

Allocation of 20 Marks---Internal evaluation

The faculty will decide the means of taking internal evaluation. It can be oral quiz, dialogue exchange, role play, reading comprehension, listening comprehension etc.

B] Semester End Examination (SEE)- 30 Marks

Maximum Marks 30

Duration : 1 Hours

Note: 1) All questions are compulsory

2)Figures to the right indicate full marks

Question No.	Particulars (Nature of Questions)	Marks
Questions with sub questions	Flexibility is given to the faculty to decide the paper pattern and depending on leaner's ability will design the question paper. It can contain questions like identifying or changing gender, identifying or changing tenses, making rhythmic words, answer in one sentence etc.	**30**
	Total	**30**

Syllabus of courses of SY B. Com (Actuarial Studies) Programme

(With effect from the Academic Year 2025-2026)

5. Field Project / Apprenticeship / Community Engagement & Services

Foundation of Research Skills - I (2 Credits)

Semester III

Field Project / Apprenticeship / Community Engagement & Services
Foundation of Research Skills (02 credits)

##CRITERIA FOR EVALUATING POWER POINT PRESENTATION/CASE STUDY/ APPLICATION BASED ACTIVITY:

MARKS: 20 FY/SY/TY BMS: Division A/B Semester: _____

Name of the Topic Date of Presentation:

Sr. No	Roll No	Name of the student	Content (5)	Team building (5)	Presentation skills		Total (20)
					Verbal (5)	Non Verbal (5)	
1							
2							
3							
4							

Sign: 1_____2._____3._____4._____Faculty Sign:_____

Name of the Topic Date of Presentation:

Sr. No	Roll No	Name of the student	Content (5)	Team building (5)	Presentation skills		Total (20)
					Verbal (5)	Non Verbal (5)	
1							
2							
3							
4							

Sign: 1_____2._____3._____4._____Faculty Sign:_____

Name of the Topic Date of Presentation:

Sr. No	Roll No	Name of the student	Content (5)	Team building (5)	Presentation skills		Total (20)
					Verbal (5)	Non Verbal (5)	
1							
2							
3							
4							

Sign: 1_____2._____3._____4._____Faculty Sign:_____

Semester IV

Syllabus of courses of SY B. Com (Actuarial Studies) Programme

(With effect from the Academic Year 2025-2026)

1. Major (1.A.a Advanced Financial Mathematics - I)

Advanced Financial Mathematics - I (4 Credits)

Semester IV

1. Major	
1.A Actuarial Studies – I	
1.A.a Advanced Financial Mathematics - I	
Course Objectives and Course Outcomes	
Course Objectives	
CObj 1	describe, interpret and discuss the theories on the behaviour of financial markets.
CObj 2	discuss the advantages and disadvantages of different measures of investment risk.
CObj 3	describe, construct, interpret and discuss the models underlying asset valuations.
Course Outcomes	
COut 1	Understand the theories on the behaviour of financial markets.
COut 2	Understand the use of different measures of investment risk.
COut 3	Understand CAPM and other asset pricing models

Modules at a Glance

Advanced Financial Mathematics – I		
Sr. No.	**Modules**	**No. of Lectures**
1	Theories of financial market behaviour	11
2	Measures of investment risk	11
3	Stochastic investment return models	11
4	Asset valuations	12
	Total No. of Lectures:	**45**

Sr. No.	Modules
1	**Theories of financial market behaviour**
	Discuss the three forms of the Efficient Markets Hypothesis and their consequences for investment management. Rational expectations theory. Rational choice theory. Explain the meaning of the term "utility function". Explain the axioms underlying utility theory and the expected utility theorem. Explain how the following economic characteristics of investors can be expressed mathematically in a utility function: • non-satiation • risk aversion, risk neutrality and risk seeking • declining or increasing absolute and relative risk aversion Discuss the economic properties of commonly used utility functions. Discuss how a utility function may depend on current wealth and discuss state dependent utility functions. State conditions for absolute dominance and for first and second-order dominance. Analyse simple insurance problems in terms of utility theory. Behavioural economics : Describe the main features of Kahneman and Tversky's prospect theory critique of expected utility theory. Explain what is meant by "framing", "heuristics" and "bias" in the context of financial markets and describe the following features of behaviour in markets. Describe the Bernartzi and Thaler solution to the equity premium puzzle.
2	**Measures of investment risk**
	Define the following measures of investment risk: • variance of return • downside semi-variance of return • shortfall probabilities • Value at Risk (VaR) / Tail VaR

	Describe how the risk measures are related to the form of an investor's utility function. Perform calculations using the risk measures to compare investment opportunities. Describe how insurance companies help to reduce or remove risk. Explain what is meant by the terms "moral hazard" and "adverse selection".
3	**Stochastic investment return models**
	Show an understanding of simple stochastic models for investment returns. Describe the concept of a stochastic investment return model and the fundamental distinction between this and a deterministic model. Derive algebraically, for the model in which the annual rates of return are independently and identically distributed and for other simple models, expressions for the mean value and the variance of the accumulated amount of a single premium. Derive algebraically, for the model in which the annual rates of return are independently and identically distributed, recursive relationships which permit the evaluation of the mean value and the variance of the accumulated amount of an annual premium. Derive analytically, for the model in which each year the random variable $(1 + r)$ has an independent log-normal distribution, the distribution functions for the accumulated amount of a single premium and for the present value of a sum due at a given specified future time.
4	**Asset valuations**
	Describe and discuss the assumptions of mean-variance portfolio theory. Discuss the conditions under which application of mean-variance portfolio theory leads to the selection of an optimum portfolio. Calculate the expected return and risk of a portfolio of many risky assets, given the expected return, variance and covariance of returns of the individual assets, using mean-variance portfolio theory. Explain the benefits of diversification using mean-variance portfolio theory. Describe the assumptions, principal results and uses of the Sharpe-Lintner-Mossin Capital Asset Pricing Model (CAPM). Discuss the limitations of the basic CAPM and some of the attempts that have been made to develop the theory to overcome these limitations. Perform calculations using the CAPM. Discuss the main issues involved in estimating parameters for asset pricing models. Describe the three types of multifactor models of asset returns: • macroeconomic models • fundamental factor models • statistical factor models Discuss the single index model of asset returns. Discuss the concepts of diversifiable and non-diversifiable risk. Discuss the construction of the different types of multifactor models. Perform calculations using both single and multi-factor models.

Advanced Financial Mathematics – I

Question Paper Pattern (Academic Year: 2025-2026)

Internal Examination & Semester End Examination – 100 Marks

A] Internals-40 Marks

Allocation of 40 Marks---Internal evaluation

Method of evaluation	**Total marks**
Assignments	20
Power Point Presentation and Group discussion	20
TOTAL	**40**

B] Semester End Examination (SEE)- 60 Marks

Maximum Marks 60

Duration : 2 Hours

Note: 1) All questions are compulsory

2)Figures to the right indicate full marks

Question No.	**Particulars (Nature of Questions)**	**Marks (Given)**	**Marks (To Be Attempted)**
Q-1	Attempt the following		
	E. Theory/Concept-based question F. Theory/Concept-based question G. Theory/Concept-based question H. Theory/Concept-based question	5 5 5 5	20
Q-2	Attempt the following		
	E. Theory/Concept-based question F. Theory/Concept-based question G. Theory/Concept-based question H. Theory/Concept-based question	5 5 5 5	20
Q-3	Attempt **any one** of the following		
	C. Attempt the following a. Theory/Concept-based question b. Theory/Concept-based question D. Theory/Concept-based question	 10 10 20	20
	Total	**80**	**60**

Reference Books

- Ethics in quantitative finance. Johnson, T. Palgrave Macmillan, 2017.
- Financial calculus: an introduction to derivative pricing. Baxter, M.; Rennie, A. CUP, 1996.
- Financial economics: with applications to investments, insurance and pensions. Panjer, H. H. (ed) The Actuarial Foundation, 2001.
- Interest rate models: an introduction. Cairns, Andrew J. G. Princeton University Press, 2004.
- Introduction to mathematical portfolio theory. Joshi, Mark S.; Paterson, Jane M. Cambridge University Press, 2013.
- Louis Bachelier's Theory of Speculation: the origins of modern finance. Bachelier, Louis; Davies, M. and Etheridge, A. (translators). Princeton University Press,
- Modern portfolio theory and investment analysis. 9th ed. Elton, E. J.; Gruber, M. J.; Brown, S. J. et al. John Wiley, 2014.
- Options, futures and other derivatives. 11th edition, 2021.

Syllabus of courses of SY B. Com (Actuarial Studies) Programme

(With effect from the Academic Year 2025-2026)

1. Major (1.A.b Advanced Financial Mathematics – II)

Advanced Financial Mathematics –II (4 Credits)

Semester IV

1. Major	
1.A Actuarial Studies – I	
1.A.b Advanced Financial Mathematics – II	
Course Objectives and Course Outcomes	
Course Objectives	
CObj 1	discuss the advantages and disadvantages of different measures of investment risk.
CObj 2	describe, construct, interpret and discuss the models underlying asset valuations.
CObj 3	describe, construct, interpret and discuss the models underlying liability valuations.
CObj 4	describe, construct, interpret and discuss the models underlying option pricing.
Course Outcomes	
COut 1	Understands the types of investment risks
COut	Understands the valuation of different assets
COut	Understands underlying liability valuations
COut	Understands underlying option pricing.

Modules at a Glance

Advanced Financial Mathematics – II		
Sr. No.	**Modules**	**No. of Lectures**
1	Asset valuations	11
2	Term structures of interest rates and models for credit risk	11
3	Liability valuations	11
4	Option theory	12
	Total No. of Lectures:	**45**

Sr. No.	Modules
1	**Asset valuations**
	Discuss the continuous time log-normal model of security prices and the empirical evidence for or against the model. Explain the definition and basic properties of standard Brownian motion or Wiener process. Demonstrate a basic understanding of stochastic differential equations, the Ito integral, diffusion and mean-reverting processes. State Ito's Lemma and be able to apply it to simple problems. Write down the stochastic differential equation for geometric Brownian motion and show how to find its solution. Write down the stochastic differential equation for the Ornstein-Uhlenbeck process and show how to find its solution. Explain the principal concepts and terms underlying the theory of a term structure of interest rates. Describe the desirable characteristics of models for the term-structure of interest rates. Apply the term structure of interest rates to modelling various cash flows, including alculating the sensitivity of the value to changes in the term structure.
2	**Term structures of interest rates and models for credit risk**
	Explain the principal concepts and terms underlying the theory of a term structure of interest rates. Describe the desirable characteristics of models for the term-structure of interest rates. Apply the term structure of interest rates to modelling various cash flows, including calculating the sensitivity of the value to changes in the term structure Describe, as a computational tool, the risk-neutral approach to the pricing of zero coupon bonds and interest-rate derivatives for a general one-factor diffusion model for the risk-free rate of interest. Discuss the limitations of these one-factor models and show an awareness of how these issues can be addressed. Define the terms credit event and recovery rate. Describe the different approaches to modelling credit risk: structural models, reduced form models, intensity-based models. Demonstrate a knowledge and understanding of the Merton model. Demonstrate a knowledge and understanding of a two-state model for credit ratings with a constant transition intensity.

	Describe how the two-state model can be generalised to the Jarrow-Lando- Turnbull model for credit ratings.
3	**Liability valuations**
	Ruin theory : Explain what is meant by the aggregate claim process and the cash-flow process for a risk. Use the Poisson process, compound poisson process and the distribution of inter-event times to calculate probabilities of the number of events in a given time interval and waiting times. Define the probability of ruin in infinite/finite and continuous/discrete time and state and explain relationships between the different probabilities of ruin. Describe the effect on the probability of ruin, in both finite and infinite time, of changing parameter values by reasoning or simulation. Run-off triangles : Define a development factor and show how a set of assumed development factors can be used to project the future development of a delay triangle. Describe and apply a basic chain ladder method for completing the delay triangle using development factors. Describe and apply the average cost per claim method for estimating outstanding claim amounts. Describe and apply the Bornhuetter-Ferguson method for estimating outstanding claim amounts. Describe how a statistical model can be used to underpin a run off triangles approach.
4	**Option theory**
	State what is meant by arbitrage and a complete market. Outline the factors that affect option prices. Derive specific results for options which are not model dependent. Show how to use binomial trees and lattices in valuing options and solve simple examples. Derive the risk-neutral pricing measure for a binomial lattice and describe the riskneutral pricing approach to the pricing of equity options. Explain the difference between the real-world measure and the risk-neutral measure. Explain why the risk-neutral pricing approach is seen as a computational tool (rather than a realistic representation of price dynamics in the real world). State the alternative names for the risk-neutral and state-price deflator approaches to pricing. Demonstrate an understanding of the Black-Scholes derivative-pricing model and its use in valuing options and solve simple examples. Discuss the validity of the assumptions underlying the Black-Scholes model. Describe and apply in simple models, including the binomial model and the Black- Scholes model, the approach to pricing using deflators and demonstrate its equivalence to the risk-neutral pricing approach. Demonstrate an awareness of the commonly used terminology for the first, and where appropriate second, partial derivatives (the Greeks) of an option price.

Advanced Financial Mathematics – II

Question Paper Pattern (Academic Year: 2025-2026)

Internal Examination & Semester End Examination – 100 Marks

A] Internals-40 Marks

Allocation of 40 Marks---Internal evaluation

Method of evaluation	**Total marks**
Assignments	20
Power Point Presentation and Group discussion	20
TOTAL	**40**

B] Semester End Examination (SEE)- 60 Marks

Maximum Marks 60

Duration : 2 Hours

Note: 1) All questions are compulsory

2)Figures to the right indicate full marks

Question No.	**Particulars (Nature of Questions)**	**Marks (Given)**	**Marks (To Be Attempted)**
Q-1	Attempt the following		
	I. Theory/Concept-based question J. Theory/Concept-based question K. Theory/Concept-based question L. Theory/Concept-based question	5 5 5 5	20
Q-2	Attempt the following		
	I. Theory/Concept-based question J. Theory/Concept-based question K. Theory/Concept-based question L. Theory/Concept-based question	5 5 5 5	20
Q-3	Attempt **any one** of the following		
	E. Attempt the following a. Theory/Concept-based question b. Theory/Concept-based question F. Theory/Concept-based question	 10 10 20	20
	Total	**80**	**60**

Reference Books

- Ethics in quantitative finance. Johnson, T. Palgrave Macmillan, 2017.
- Financial calculus: an introduction to derivative pricing. Baxter, M.; Rennie, A. CUP, 1996.
- Financial economics: with applications to investments, insurance and pensions. Panjer, H. H. (ed) The Actuarial Foundation, 2001.
- Interest rate models: an introduction. Cairns, Andrew J. G. Princeton University Press, 2004.
- Introduction to mathematical portfolio theory. Joshi, Mark S.; Paterson, Jane M. Cambridge University Press, 2013.
- Louis Bachelier's Theory of Speculation: the origins of modern finance. Bachelier, Louis; Davies, M. and Etheridge, A. (translators). Princeton University Press,
- Modern portfolio theory and investment analysis. 9th ed. Elton, E. J.; Gruber, M. J.; Brown, S. J. et al. John Wiley, 2014.
- Options, futures and other derivatives. 11th edition, 2021.

Syllabus of courses of SY B. Com (Actuarial Studies) Programme

(With effect from the Academic Year 2025-2026)

2. Minor

Auditing (Techniques of Auditing and Audit Procedure) (3 Credits)

Semester IV

1. Major	
1.A Actuarial Studies – I	
1.A.c Auditing (Techniques of Auditing and Audit Procedure)	
Course Objectives and Course Outcomes	
Course Objectives	
CObj 1	To get the learners acquainted with scope of audit.
CObj 2	To make them aware of the risks and its assessment in insurance industry.
CObj 3	To know RBI regulations relating to audit of NBFCs and audit framework for BFSI.
CObj 4	To understand the rules and regulations governing insurance sector in India.
Course Outcomes	
COut 1	The learner appreciates the importance of audit planning.
COut 2	They understand the risks of material mis-statement.
COut 3	They prepare an audit plan and gets to understand audit procedure.
COut 4	They understand and appreciate the rules and regulations governing the insurance sector in India.

Modules at a Glance

Auditing (Techniques of Auditing and Audit Procedure)		
Sr. No.	**Modules**	**No. of Lectures**
1	General Audit consideration	11
2	Understanding Entity, Its Environment and Internal Control	11
3	Audit Framework for BFSI	11
4	Professional guidance for audit of BFSI	12
	Total No. of Lectures:	**45**

Sr. No.	Modules
1	**General Audit Consideration**
	• Introduction. • Scope of Audit Engagement. • Auditors' independence and Professional Ethics. • Audit Planning
2	**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.
3	**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.
4	**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.

Auditing (Techniques of Auditing and Audit Procedure)

Question Paper Pattern (Academic Year: 2025-2026)

Internal Examination & Semester End Examination – 100 Marks

A] Internals-40 Marks

Allocation of 40 Marks---Internal evaluation

Method of evaluation	**Total marks**
Assignments	20
Power Point Presentation and Group discussion	20
TOTAL	**40**

B] Semester End Examination (SEE)- 60 Marks

Maximum Marks 60

Duration : 2 Hours

Note: 1) All questions are compulsory

2)Figures to the right indicate full marks

Question No.	**Particulars (Nature of Questions)**	**Marks (Given)**	**Marks (To Be Attempted)**
Q-1	Attempt **any three** of the following		
(Module-I)	A. Theory/Concept-based question B. Theory/Concept-based question C. Theory/Concept-based question D. Theory/Concept-based question	5 5 5 5	15
Q-2	Attempt **any three** of the following		
(Module-II)	A. Theory/Concept-based question B. Theory/Concept-based question C. Theory/Concept-based question D. Theory/Concept-based question	5 5 5 5	15
Q-3	Attempt **any three** of the following		
(Module-III)	A. Theory/Concept-based question B. Theory/Concept-based question C. Theory/Concept-based question D. Theory/Concept-based question	5 5 5 5	15
Q-4	Attempt **any three** of the following		
(Module-IV)	A. Theory/Concept-based question B. Theory/Concept-based question C. Theory/Concept-based question D. Theory/Concept-based question	5 5 5 5	15
	Total	**80**	**60**

Reference Books (with Chapters)

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)

Syllabus of courses of SY B. Com (Actuarial Studies) Programme

(With effect from the Academic Year 2025-2026)

3. General Elective (3.A.a Business Management)

Business Management (3 Credits)

Semester IV

1. General Elective	
1.A Actuarial Studies – I	
3.A.a Business Management	
Course Objectives and Course Outcomes	
Course Objectives	
CObj 1	Provide candidates with an understanding of the business environment in which they will be working.
CObj 2	Provide candidates with an understanding of how to tackle business-related problems.
CObj 3	Provide candidates with an understanding of the basic legal principles that are relevant to actuarial work.
CObj 4	Provide candidates with an understanding of their professional responsibilities.
CObj 5	Provide candidates with an understanding of the need for lifelong learning.
Course Outcomes	
COut 1	The candidate will be able to develop an approach to strategic thinking.
COut 2	The candidate will be able to develop an approach to business decision making.
COut 3	The candidate will be able to describe or specify important aspects of professionalism and ethics.
COut 4	The candidate will be able to describe and understand the basic legal principles that are relevant to the work of an actuary and their practical implications.

Modules at a Glance

Business Management		
Sr. No.	**Modules**	**No. of Lectures**
1	Working as an actuary, professionalism, and ethics	11
2	Business strategy	11
3	Business decision making	11
4	Legal principles	12
	Total No. of Lectures:	**45**

Sr. No.	Modules
1	**Working as an actuary, professionalism, and ethics**
	• Specify the type of skills that must be acquired to become a competent practising actuary in the financial services industry. • List the aspects of an employing company about which knowledge should be obtained. • Specify those aspects of the financial services industry about which knowledge should be obtained and maintained. • Describe why it is important to know how other industries affect the financial services industry. • State those aspects of the global economy and politics about which some knowledge should be gained and maintained. • Describe the activities of the Institute and Faculty of Actuaries. • Discuss the issues and challenges faced currently by each main practice area, namely life, pensions, general, healthcare, finance, investment and enterprise risk management. • State important characteristics of a profession and its advantages to interested parties. • Demonstrate a knowledge of the Actuaries' Code that binds all members of the Institute and Faculty of Actuaries. • List the measures by which the Financial Reporting Council and the Institute and Faculty of Actuaries regulate the activities of actuaries and candidates in the UK and overseas. • Describe the corporate governance structure of the Institute and Faculty of Actuaries. • Analyse appropriate case studies relating to professionalism and ethics, and present results of the analyses.
2	**Business strategy**
	• Describe what a strategy is and how it relates to competitive advantage and competitive positioning • Develop a process for strategic decision making • Define a PEST analysis (Political/legislative, Economic, Societal, Technological) and describe how to carry one out

	• Describe how to identify business and consumer needs, and how to prioritise them • Describe the industry value chain and how to apply it • Discuss how to combat competitive forces • Learn how to communicate strategic messages to gain buy-in and attention, selecting appropriate structures to present different types of information • Discuss how a company's culture affects decision making • Discuss how a company's structure affects decision making • Analyse case studies and present results of analysis.
3	**Business decision making**
	• Discuss the importance of a clear mission statement. • Describe the importance of a clear business strategy. • Describe the benefits of teamwork. • Describe the advantages of time management. • Discuss the importance of extracting relevant information from a large volume of data. • Describe the interaction of various company functions. • Discuss the value of different people skills. • Assess their ability to influence others. • Discuss the advantages of communicating clearly. • Describe how to develop a decision making process. • Discuss attitude to risk in decision making. • Discuss how competition can affect a market.
4	**Legal principles**
	• Appreciate the sources of English law and how Scottish law may differ (overview only). • Understand the requirements for a valid contract (overview only). • Identify when the courts will imply terms into contracts. • Understand the extent to which liability can be excluded. • Make simple assessments of likely contractual remedies. • Calculate a basic award of damages. • Identify the factors that must be established before liability for professional negligence can arise. • Understand the concept of a trust and the duties of trustees. • Understand the concept of agency and list the types of authority an agent may possess. • Appreciate the concepts of separate legal personality and limited liability. • Understand and, at a basic level, be able to explain the role of directors and shareholders within a company. • Appreciate the duties imposed on directors by statute, common law and equity. • At a basic level, be able to explain the nature of partnership and the duties owed by partners to insiders and third parties.

Business Management

Question Paper Pattern (Academic Year: 2025-2026)

Internal Examination & Semester End Examination – 100 Marks

A] Internals-40 Marks

Allocation of 40 Marks---Internal evaluation

Method of evaluation	**Total marks**
Assignments/Workbook	20
Power Point Presentation and Group discussion	20
TOTAL	**40**

B] Semester End Examination (SEE)- 60 Marks

Maximum Marks 60

Duration : 2 Hours

Note: 1) All questions are compulsory

2)Figures to the right indicate full marks

Question No.	**Particulars (Nature of Questions)**	**Marks**
Questions with sub questions	Flexibility is given to the faculty to decide the paper pattern and depending on leaner's ability will design the question paper. It can contain questions like identifying or changing gender, identifying or changing tenses, making rhythmic words, answer in one sentence etc.	**60**
	Total	**60**

Syllabus of courses of SY B. Com (Actuarial Studies) Programme

(With effect from the Academic Year 2025-2026)

4. Major (4.A.a Advanced Financial Mathematics with Spreadsheet)

Advanced Financial Mathematics with Spreadsheet (4 Credits)

Semester IV

4. Vocational & Skill Enhancement Courses (VSEC)	
4.B Skill Enhancement Courses (SEC)	
4.B.a Advanced Financial Mathematics with Spreadsheet	
Course Objectives and Course Outcomes	
Course Objectives	
CObj 1	discuss the advantages and disadvantages of different measures of investment risk.
CObj 2	describe, construct, interpret and discuss the models underlying asset valuations.
CObj 3	describe, construct, interpret and discuss the models underlying liability valuations.
CObj 4	describe, construct, interpret and discuss the models underlying option pricing.
Course Outcomes	
COut 1	Understands the types of investment risks
COut 2	Understands the valuation of different assets
COut 3	Understands underlying liability valuations
COut 4	Understands underlying option pricing.

Modules at a Glance

Sr. No.	Modules	No. of Lectures
1	Stochastic investment return models	11
2	Asset valuations and Measures of investment risk	11
3	Liability valuations	11
4	Option theory	12
	Total No. of Lectures:	**45**

Sr. No.	Modules
1	**Stochastic investment return models**
	Derive algebraically, for the model in which the annual rates of return are independently and identically distributed and for other simple models, expressions for the mean value and the variance of the accumulated amount of a single Premium Derive algebraically, for the model in which the annual rates of return are independently and identically distributed, recursive relationships which permit the evaluation of the mean value and the variance of the accumulated amount of an annual premium Derive analytically, for the model in which each year the random variable (1 + r) has an independent log-normal distribution, the distribution functions for the accumulated amount of a single premium and for the present value of a sum due at a given specified future time Apply the above results to the calculation of the probability that a simple sequence of payments will accumulate to a given amount at a specific future time.
2	**Asset valuations and Measures of investment risk**
	Calculate the expected return and risk of a portfolio of many risky assets, given the expected return, variance and covariance of returns of the individual assets, using mean-variance portfolio theory Apply the term structure of interest rates to modelling various cash flows, including calculating the sensitivity of the value to changes in the term structure Describe, as a computational tool, the risk-neutral approach to the pricing of zero-coupon bonds and interest-rate derivatives for a general one-factor diffusion model for the risk-free rate of interest. Perform calculations using commonly used utility functions to compare investment opportunities

	Perform calculations using the risk measures like variance of return, downside semi-variance of return, shortfall probabilities, Value at Risk (VaR) / Tail VaR above to compare investment opportunities.
3	**Liability valuations**
	Use the Poisson process and the distribution of inter-event times to calculate probabilities of the number of events in a given time interval and waiting times Calculate probabilities of ruin by simulation apply the average cost per claim method for estimating outstanding claim amounts. apply the Bornhuetter-Ferguson method for estimating outstanding claim amounts. Value basic benefit guarantees using simulation techniques
4	**Option theory**
	Show how to use the Black-Scholes model in valuing options and solve simple examples Show how to use binomial trees and lattices in valuing options and solve simple Examples Describe and apply in simple models, including the binomial model and the Black-Scholes model, the approach to pricing using deflators and demonstrate its equivalence to the risk-neutral pricing approach

Advanced Financial Mathematics with Spreadsheet

Question Paper Pattern (Academic Year: 2025-2026)

Internal Examination & Semester End Examination – 100 Marks

A] Internals-40 Marks

Allocation of 40 Marks---Internal evaluation

Method of evaluation	**Total marks**
Assignments	20
Excel based test	20
TOTAL	**40**

B] Semester End Examination (SEE)- 60 Marks

Maximum Marks 60

Duration : 2 Hours

Note: 1) All questions are compulsory

2)Figures to the right indicate full marks

Question No.	**Particulars (Nature of Questions)**	**Marks (Given)**	**Marks (To Be Attempted)**
Q-1	Attempt **any two** of the following		
	A. Concept-based question B. Concept-based question C. Concept-based question	10 10 10	20
Q-2	Attempt **any two** of the following		
	A. Concept-based question B. Concept-based question C. Concept-based question	10 10 10	20
Q-3	Attempt the following		
	A. Concept-based question	20	20
	Total	**80**	**60**

Reference Books (with Chapters)

- Ethics in quantitative finance. Johnson, T. Palgrave Macmillan, 2017.
- Financial calculus: an introduction to derivative pricing. Baxter, M.; Rennie, A. CUP, 1996.
- Financial economics: with applications to investments, insurance and pensions. Panjer, H. H. (ed) The Actuarial Foundation, 2001.
- Interest rate models: an introduction. Cairns, Andrew J. G. Princeton University Press, 2004.
- Introduction to mathematical portfolio theory. Joshi, Mark S.; Paterson, Jane M. Cambridge University Press, 2013.
- Louis Bachelier's Theory of Speculation: the origins of modern finance. Bachelier, Louis; Davies, M. and Etheridge, A. (translators). Princeton University Press,
- Modern portfolio theory and investment analysis. 9th ed. Elton, E. J.; Gruber, M. J.; Brown, S. J. et al. John Wiley, 2014.
- Options, futures and other derivatives. 11th edition, 2021.
- Mastering Financial Modelling in Microsoft Excel – Alastair Day

Syllabus of courses of SY B. Com (Actuarial Studies) Programme

(With effect from the Academic Year 2025-2026)

5. Ability Enhancement Courses, Value Enhancement Course, Indian Knowledge System

5.A Ability Enhancement Course (AEC)

5.A.a Linguistic Studies II (3 Credits)

Semester IV

5. Ability Enhancement Courses, Value Enhancement Course, Indian Knowledge System	
5.A Ability Enhancement Course (AEC)	
5.A.a Linguistic Studies II	
Course Objectives and Course Outcomes	
Course Objectives	
CObj 1	To create curiosity in the minds of learns about the chosen language
CObj 2	To help the learners understand the need to learn the chosen language
CObj 3	To introduce learners to the structure of the chosen language
CObj 4	To understand the richness of Indian selected languages with reference to consonants and vowels
CObj 5	To understand unique characteristics of the chosen language
CObj 6	To understand the use of gender and tenses
CObj 7	To understand the use of idioms and phrases
CObj 8	To know the various dialects of the chosen language
CObj 9	To understand the application of technology for communication by alternatively abled
CObj 10	To understand the need of learning functional language
CObj 11	To get familiarized with the literature of the chosen language
CObj 12	To get familiarized with the literature translated to the chosen language from other languages
CObj 13	To learn to appreciate the other literary forms of the chosen language
Course Outcomes	
COut 1	The learner will be curious to learn the chosen language
COut 2	The leaner will be able to understand the need to learn the chosen language
COut 3	The learner will get familiar with the structure of the chosen language

COut 4	To understand the richness of Indian selected languages with reference to constants and vowels
COut 5	To understand unique characteristics of the chosen language
COut 6	To understand the use of gender and tenses
COut 7	To understand the use of idioms and phrases
COut 8	To know the various dialects of the chosen language
COut 9	To understand the application of technology for communication by alternatively abled
COut 10	To understand the need of learning functional language
Cout 11	To get familiarized with the literature of the chosen language
Cout 12	To get familiarized with the literature translated to the chosen language from other languages
Cout 13	To learn to appreciate the other literary forms of the chosen language

Modules at a Glance

Linguistic Studies II (Hindi/Marathi/Sanskrit) Any One		
Sr. No.	**Modules**	**No. of Lectures**
1	Select Studies in Translated Literature	10
2	Functional and Commercial Language	10
3	Forms of Literary Expressions	10
	Total No. of Lectures:	**45**

Sr. No.	Modules
1	**Select Studies in Translated Literature**
	Translated Literature and Cultural Exchange Review of Translated Literature using Translated Literary work from another language to chosen language. (The choice of the texts should be made by the learner with due discussion with the faculty). Based on this module, internal evaluation shall be done.
2	**Functional and Commercial Language**
	• Newspaper reading of the chosen language in the class along with faculty • Watching and understanding News channel of the chosen language • Translation of often used words in office circulars and government communications • Simple conversations in the chosen language • Banking and financial terms in the chosen language
3	**Forms of Literary Expressions**

	• Appreciation of select forms of literature
	  ○ Films
	  ○ Theatre
	  ○ Performing Arts
	  ○ Fine Arts
	• The faculty member shall discuss with the learners about the richness of other forms of Literary expressions in chosen language and learn to appreciate the creativity and presenting the creativity in a lighter form. Also, they are expected to appreciate the cultural dimensions behind it.

Linguistic Studies II

Question Paper Pattern (Academic Year: 2025-2026)

Internal Examination & Semester End Examination – 50 Marks

A] Internals-20 Marks

Allocation of 20 Marks---Internal evaluation

The faculty will decide the means of taking internal evaluation. It can be oral quiz, dialogue exchange, role play, reading comprehension, listening comprehension etc.

B] Semester End Examination (SEE)- 30 Marks

Maximum Marks 30

Duration : 1 Hours

Note: 1) All questions are compulsory

2)Figures to the right indicate full marks

Question No.	Particulars (Nature of Questions)	Marks
Questions with sub questions	Flexibility is given to the faculty to decide the paper pattern and depending on leaner's ability will design the question paper. It can contain questions like identifying or changing gender, identifying or changing tenses, making rhythmic words, answer in one sentence etc.	**30**
	Total	**30**

Syllabus of courses of SY B. Com (Actuarial Studies) Programme

(With effect from the Academic Year 2025-2026)

5. Field Project / Apprenticeship / Community Engagement & Services

Project Work (2 Credits)

Semester IV

Field Project / Apprenticeship / Community Engagement & Services

Field Project / Apprenticeship / Community Engagement & Services (02 credits)

1. The learner would need to submit a project based on Internship and a project based on a Research topic for semester III and IV.
2. The learner submitting the project work for internship could do the same in semester III and the project work based on a topic could be submitted in semester IV or vice versa.
3. The learner could select the order of submission for semester III and IV.
4. The submissions would be subjected to plagiarism and the report of the same to be attached at the end of the project

The learner will be required to fulfil the following requirements to be able to submit the project work based on Internship:

- **Minimum 30 working days/150 hours of internship with an Organisation/ NGO**
- **Details of the Organisation/ NGO**:

  i) Why it was selected- objective/s

  ii) Work Culture

  iii) Type of the Organisation

  iv) Organisation Structure

  v) Types of product & Service offered by the Organisation

- **Learning Objectives**
- **Work done by the student.**

  Department, product/s handled, Department visited & his/her observation about those department.
- **Learner's experience and whether he/she feels that the objective/s have been achieved.**

  Note: for internship
- ***Experience certificate/ Internship completion certificate to be attached.***

Evaluation:

Viva Voce	Marks
External guide	30
Internal guide	20
Total	50

A Power Point presentation should be prepared showcasing the highlights of the project.

The learner will be required to submit a Research topic-based Project following the below mentioned guidelines:

- **Introduction:**
- **Why the Organisation was selected, objective of study, scope and limitations.**
- **Literature Overview**
- **Research Methodology:**

  i) Primary- Sample 40-50 respondents

  ii) Secondary

  iii) Hypothesis

  iv) Questionnaire

  v) Statistical tools & Techniques
- **Classification & Tabulation of Data**
- **Analysis & Interpretation of Data**
- **Conclusions & Recommendations**

Evaluation:

Viva Voce	Marks
External guide	30
Internal guide	20
Total	50

A Power Point presentation should be prepared showcasing the highlights of the project.

##CRITERIA FOR EVALUATING POWER POINT PRESENTATION/CASE STUDY/ APPLICATION BASED ACTIVITY:

MARKS: 20 FY/SY/TY BMS: Division A/B Semester:

Name of the Topic Date of Presentation:

Sr. No	Roll No	Name of the student	Content (5)	Team building (5)	Presentation skills		Total (20)
					Verbal (5)	Non-Verbal (5)	
1							
2							
3							
4							

Sign: 1_____2._____3._____4._____Faculty Sign:

Name of the Topic Date of Presentation:

Sr. No	Roll No	Name of the student	Content (5)	Team building (5)	Presentation skills		Total (20)
					Verbal (5)	Non-Verbal (5)	
1							
2							
3							
4							

Sign: 1_____2._____3._____4._____Faculty Sign:_____

Name of the Topic Date of Presentation:

Sr. No	Roll No	Name of the student	Content (5)	Team building (5)	Presentation skills		Total (20)
					Verbal (5)	Non Verbal (5)	
1							
2							
3							
4							

Sign: 1_____2._____3._____4._____Faculty Sign:_____