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)

Third Year (Semester V & VI)

Under Choice Based Credit System

Academic Year 2025-2026

Faculty of Commerce

www.rapodar.ac.in

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

No. of Courses	Course Code	Semester V	Credits
1		**Major (12 credits)**	
1.A		**Discipline Specific Course**	
1.A.a		Statistical Modelling – I	**04**
1.A.b		Statistical Modelling – II	**04**
1.B		**Discipline Specific Elective**	
1.B.a		Statistical Modeling with R programming	**04**
2		**Minor (03 credits)**	
2.A.a		Customer Relationship Management I	**03**
3		**General Elective (GE)/ Open Elective (OE) (03 Credits)**	
3.A.a		Designing in Digital Marketing	**03**
4		**Vocational & Skill Enhancement Course (VSEC) (02 credits)**	
4A		**Vocational Skill Course (VSC)**	
4.A. a		Business Communication in German - I	**02**
4.B		**Skill Enhancement Course (SEC)**	
		-	
5		**Ability Enhancement Course, Value Enhancement Course, Indian Knowledge System (02 credits)**	
5.A		**Ability Enhancement Course (AEC)**	
5.A.a		-	
5.B		**Value Enhancement Course (VEC)**	
5.B.a			
5.B.b		Paper Review	**02**
TOTAL		**CUMULATIVE CREDITS**	**22**

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

No. of Courses	Course Code	Semester VI	Credits
1		**Major (12 credits)**	
1.A		**Discipline Specific Course**	
1.A.a		Enterprise Risk Management	**04**
1.A.b		Ethics and Professional Standards	**04**
1.B		**Discipline Specific Elective**	
1.B.a		Investment Analysis	**04**
2		**Minor (03 credits)**	
2.A.a		Customer Relationship Management II	**03**
3		**General Elective (GE)/ Open Elective (OE) (03 Credits)**	
3.A.a		Cyber Security	**03**
4		**Vocational & Skill Enhancement Courses (VSEC) (02 credits)**	
4A		**Vocational Skill Course (VSC)**	
		Business Communication in German- II	**02**
4.B		**Skill Enhancement Course (SEC)**	
5		**Enhancement Course, Value Enhancement Course, Indian Knowledge System (02 credits)**	
5.A		**Ability Enhancement Course (AEC)**	
5.A.a			
5.B		**Value Enhancement Course (VEC)**	
5.B.a			
5.C		**Field Project / Apprenticeship / Community Engagement & Services**	
5.C.a		Project Work II	**02**
TOTAL		**CUMULATIVE CREDITS**	**22**

Syllabus of courses of TY B. Com (Actuarial Studies) Programme
(With effect from the Academic Year 2025-2026)
1. Major

Statistical Modeling – I (4 Credits)
Semester V

1. Major	
Statistical Modelling - I	
Course Objectives and Course Outcomes	
Course Objectives	
CObj 1	To enable the learner to describe and use statistical distributions for risk modelling
CObj 2	To equip the learner to apply the main concepts underlying the analysis of time series models
CObj 3	To empower the learner to analyse and apply Markov chains and processes
Course Outcomes	
COut 1	Learner gets an understanding of risk modelling
COut 2	Learner understands application of Markov process
COut 3	Learner understands Time series and their applications

Modules at a Glance

	Statistical Modelling - I	
Sr. No.	**Modules**	**No. of Lectures**
1	Stochastic processes (Markov process)	11
2	Stochastic processes (Kolmogorov process)	11
3	Time Series and their application	11
4	Lifetime distributions and Transition intensities dependent on age	12
	Total No. of Lectures:	**45**

Sr. No.	Modules
Unit 1	**Stochastic processes (Markov process)**
	Define and classify a stochastic process according to whether it: - operates in continuous or discrete time - has a continuous or a discrete state space - is a mixed type Explain what is meant by the Markov property in the context of a stochastic process and in terms of filtrations. State the essential features of a Markov chain model. Calculate the stationary distribution for a Markov chain in simple cases. Describe a system of frequency based experience rating in terms of a Markov chain and describe other simple applications. Describe a time-inhomogeneous Markov chain model and describe simple applications. Demonstrate how Markov chains can be used as a tool for modelling and how they can be simulated. State the essential features of a Markov process model and Markov jump process. Define a Poisson process, derive the distribution of the number of events in a given time interval, derive the distribution of inter-event times, and apply these results.
Unit 2	**Stochastic processes (Kolmogorov process)**
	State the Chapman-Kolmogorov equations that represent a Markov chain.

		Derive the Kolmogorov equations for a Markov process with time independent and time/age dependent transition intensities. Solve the Kolmogorov equations in simple cases. State the Kolmogorov equations for a model where the transition intensities depend not only on age/time, but also on the duration of stay in one or more states. Describe sickness and marriage models in terms of duration dependent Markov processes and describe other simple applications. Demonstrate how Markov jump processes can be used as a tool for modelling and how they can be simulated.
Unit 3	**Time Series and their application**	
		Explain the concept and general properties of stationary, and integrated, univariate time series. Explain the concept of a stationary random series a filter applied to it. Know the notation for backwards shift operator, backwards difference operator, and the concept of roots of the characteristic equation of time series. Explain the concepts and basic properties of autoregressive (AR), moving average (MA), autoregressive moving average (ARMA) and autoregressive integrated moving average (ARIMA) time series. Explain the concept and properties of discrete random walks and random walks with normally distributed increments, both with and without drift. Explain the basic concept of a multivariate autoregressive model. Explain the concept of cointegrated time series. Show that certain univariate time series models have the Markov property and describe how to rearrange a univariate time series model as a multivariate Markov model. Outline the processes of identification, estimation and diagnosis of a time series, the criteria for choosing between models and the diagnostic tests that might be applied to the residuals of a time series after estimation. Describe briefly other non-stationary, non-linear time series models. Describe simple applications of a time series model, including random walk, autoregressive and cointegrated models as applied to security prices and other economic variables. Develop deterministic forecasts from time series data, using simple extrapolation and moving average models, applying smoothing techniques and seasonal adjustment when appropriate.
Unit 4	**Lifetime distributions and Transition intensities dependent on age**	

Describe the various ways in which lifetime data might be censored. Describe the estimation of the empirical survival function in the absence of censoring, and what problems are introduced by censoring.

Describe the Kaplan-Meier (or product limit) estimator of the survival function. Describe the Nelson-Aalen estimator of the cumulative hazard rate. Describe models for proportional hazards, and how these models can be used to estimate the impact of covariates on the hazard.
Describe the Cox model for proportional hazards, derive the partial likelihood estimate in the absence of ties.

Derive the likelihood function for constant transition intensities in a Markov model of transfers between states given the statistics. Derive maximum likelihood estimators for the transition intensities and state their asymptotic joint distribution. State the Poisson approximation to the estimator.

Explain the importance of dividing the data into homogeneous classes, including subdivision by age and sex. Describe the principle of correspondence and explain its fundamental importance in the estimation procedure. Specify the data needed for the exact calculation of a central exposed to risk (waiting time) depending on age and sex.

Explain how to obtain estimates of transition probabilities, including in the single decrement model the actuarial estimate based on the simple adjustment to the central exposed to risk. Explain the assumptions underlying the census approximation of waiting times. Explain the concept of the rate interval.

Teaching Pedagogy

Lectures/tutorials/field work/outreach activities/ project work/ vocational training/ viva / seminars / term papers/ assignments / presentations / self-study/case studies etc. or a combination of some of these. Sessions shall be interactive in nature to enable peer group learning.

Statistical Modelling - 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
Assignments	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.	Numerical/Concept-based question	5	15
	B.	Numerical/Concept-based question	5	
	C.	Numerical/Concept-based question	5	
	D.	Numerical/Concept-based question	5	
Q-2	Attempt **any three** of the following			
(Module-II)	A.	Numerical/Concept-based question	5	15
	B.	Numerical/Concept-based question	5	
	C.	Numerical/Concept-based question	5	
	D.	Numerical/Concept-based question	5	
Q-3	Attempt **any three** of the following			
(Module-III)	A.	Numerical/Concept-based question	5	15
	B.	Numerical/Concept-based question	5	
	C.	Numerical/Concept-based question	5	
	D.	Numerical/Concept-based question	5	
Q-4	Attempt **any three** of the following			
(Module-IV)	A.	Numerical/Concept-based question	5	15
	B.	Numerical/Concept-based question	5	
	C.	Numerical/Concept-based question	5	
	D.	Numerical/Concept-based question	5	
	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 TY B. Com (Actuarial Studies) Programme
(With effect from the Academic Year 2025-2026)
1. Major

Statistical Modeling – II (4 Credits)
Semester V

1. Major	
Statistical Modelling - II	
Course Objectives and Course Outcomes	
Course Objectives	
CObj 1	Describe and use statistical distributions for risk modelling
CObj 2	Describe and apply techniques of copulas and extreme value theory
CObj 3	Describe and apply techniques of survival analysis
Course Outcomes	
COut 1	Learner understands the concepts of risk modelling
COut 2	Learner understands the application in reinsurance
COut 3	Learner understands the techniques of copulas and extreme value theory
COut 4	Learner understands the techniques of survival analysis

Modules at a Glance

Sr. No.	Modules	No. of Lectures
	Statistical Modelling - II	
1	Loss distributions, with and without risk sharing	11
2	Compound distributions and their applications in risk modelling	11
3	Introduction to copulas and extreme value theory and survival models	11
4	Graduation, Mortality projection and Machine learning	12
	Total No. of Lectures:	**45**

Sr. No.	Modules
Unit 1	**Loss distributions, with and without risk sharing**
	Describe the properties of the statistical distributions which are suitable for modelling individual and aggregate losses. Explain the concepts of excesses (deductibles), and retention limits.
	Describe the operation of simple forms of proportional and excess of loss reinsurance. Derive the distribution and corresponding moments of the claim amounts paid by the insurer and the reinsurer in the presence of excesses (deductibles) and reinsurance.
	Estimate the parameters of a failure time or loss distribution when the data is complete, or when it is incomplete, using maximum likelihood and the method of moments.
	Fit a statistical distribution to a dataset and calculate appropriate goodness of fit measures.
Unit 2	**Compound distributions and their applications in risk modelling**
	Construct models appropriate for short term insurance contracts in terms of the numbers of claims and the amounts of individual claims. Describe the major simplifying assumptions underlying the models.

	Define a compound Poisson distribution and show that the sum of independent random variables each having a compound Poisson distribution also has a compound Poisson distribution. Derive the mean, variance and coefficient of skewness for compound binomial, compound Poisson and compound negative binomial random variables. Repeat for both the insurer and the reinsurer after the operation of simple forms of proportional and excess of loss reinsurance.
Unit 3	**Introduction to copulas and extreme value theory and Survival Models**
	Describe how a copula can be characterised as a multivariate distribution function which is a function of the marginal distribution functions of its variates, and explain how this allows the marginal distributions to be investigated separately from the dependency between them. Explain the meaning of the terms dependence or concordance, upper and lower tail dependence; and state in general terms how tail dependence can be used to help select a copula suitable for modelling particular types of risk. Describe the form and characteristics of the Gaussian copula and the Archimedean family of copulas. Recognise extreme value distributions, suitable for modelling the distribution of severity of loss and their relationships. Calculate various measures of tail weight and interpret the results to compare the tail weights. Describe the model of lifetime or failure time from age x as a random variable. State the consistency condition between the random variable representing lifetimes from different ages. Define the distribution and density functions of the random future lifetime, the survival function, the force of mortality or hazard rate, and derive relationships between them. State the Gompertz and Makeham laws of mortality. Define the curtate future lifetime from age x and state its probability function. Define the expected value and variance of the complete and curtate future lifetimes and derive expressions for them. Describe the two-state model of a single decrement and compare its assumptions with those of the random lifetime model
Unit 4	**Graduation, Mortality projection and Machine learning**

	Describe the process of graduation by the following methods, and state the advantages and disadvantages. Describe how the tests should be amended to compare crude and graduated sets of estimates.
	Describe how the tests should be amended to allow for the presence of duplicate policies. Carry out a comparison of a set of crude estimates and a standard table, or of a set of crude estimates and a set of graduated estimates.
	Describe the approaches to the forecasting of future mortality rates based on extrapolation, explanation and expectation, and their advantages and disadvantages. Describe the Lee-Carter, age-period-cohort, and p-spline regression models for forecasting mortality.
	Use an appropriate computer package to apply the models to a suitable mortality dataset. List the main sources of error in mortality forecasts.
	Explain the main branches of machine learning and describe examples of the types of problems typically addressed by machine learning. Explain and apply high-level concepts relevant to learning from data.
	Describe and give examples of key supervised and unsupervised machine learning techniques, explaining the difference between regression and classification and between generative and discriminative models.
	Explain in detail and use appropriate software to apply machine learning techniques (eg penalised regression and decision trees) to simple problems.
	Demonstrate an understanding of the perspectives of statisticians, data scientists, and other quantitative researchers from non-actuarial backgrounds.

Teaching Pedagogy

Lectures/tutorials/field work/outreach activities/ project work/ vocational training/ viva / seminars / term papers/ assignments / presentations / self-study/case studies etc. or a combination of some of these. Sessions shall be interactive in nature to enable peer group learning.

Statistical Modelling - 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
Assignments	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. Numerical/Concept-based question	5	
	B. Numerical/Concept-based question	5	15
	C. Numerical/Concept-based question	5	
	D. Numerical/Concept-based question	5	
Q-2	Attempt **any three** of the following		
(Module-II)	A. Numerical/Concept-based question	5	
	B. Numerical/Concept-based question	5	15
	C. Numerical/Concept-based question	5	
	D. Numerical/Concept-based question	5	
Q-3	Attempt **any three** of the following		
(Module-III)	A. Numerical/Concept-based question	5	
	B. Numerical/Concept-based question	5	15
	C. Numerical/Concept-based question	5	
	D. Numerical/Concept-based question	5	
Q-4	Attempt **any three** of the following		
(Module-IV)	A. Numerical/Concept-based question	5	
	B. Numerical/Concept-based question	5	15
	C. Numerical/Concept-based question	5	
	D. Numerical/Concept-based question	5	
	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 TY B. Com (Actuarial Studies) Programme
(With effect from the Academic Year 2025-2026)
1.B Discipline Specific Elective

Statistical Analysis with R programming (4 Credits)
Semester V

1.B Discipline Specific Elective	
Statistical Analysis with R programming	
Course Objectives and Course Outcomes	
Course Objectives	
CObj 1	Use statistical distributions for risk modelling in R programming
CObj 2	Apply techniques of copulas and extreme value theory in R programming
CObj 3	Apply techniques of survival analysis in R programming
CObj 4	Apply Markov chains and processes in R programming
Course Outcomes	
COut 1	Learner understands the concepts of risk modelling in R programming
COut 2	Learner understands the application in reinsurance in R programming
COut 3	Learner applies the techniques of copulas and extreme value theory in R programming
COut 4	Learner understands the techniques of survival analysis in R programming

Modules at a Glance

	Statistical Analysis with R programming	
Sr. No.	**Modules**	**No. of Lectures**
1	Poisson process, risk and Markov chain model	11
2	Markov process and Time series	11
3	Survival models	11
4	Mortality projection and machine learning	12
	Total No. of Lectures:	**45**

Sr. No.	Modules
Unit 1	**Poisson process, risk and Markov chain model**
	Define a Poisson process, derive the distribution of the number of events in a given time interval, derive the distribution of inter-event times, and apply these results. Define a compound Poisson distribution and show that the sum of independent random variables, each having a compound Poisson distribution, also has a compound Poisson distribution. Specify the data needed for the exact calculation of a central exposed to risk (waiting time) depending on age and sex. Develop census formulae given age at birthday where the age may be classified as next, last, or nearest relative to the birthday as appropriate, and the deaths and census data may use different definitions of age. State the essential features of a Markov chain model. Calculate the stationary distribution for a Markov chain in simple cases. Describe a time-inhomogeneous Markov chain model and describe simple applications. Demonstrate how Markov chains can be used as a tool for modelling and how they can be simulated. Demonstrate how Markov chains can be used as a tool for modelling and how they can be simulated. Fit a statistical distribution to a dataset and calculate appropriate goodness-of-fit measures.

Unit 2	**Markov process and Time series**
	Derive the Kolmogorov equations for a Markov process with time independent and time/age-dependent transition intensities. Solve the Kolmogorov equations in simple cases. Describe simple survival models, sickness models and marriage models in terms of Markov processes and describe other simple applications.
	State the Kolmogorov equations for a model where the transition intensities depend not only on age/time, but also on the duration of stay in one or more states.
	Describe sickness and marriage models in terms of duration-dependent Markov processes and describe other simple applications. Demonstrate how Markov jump processes can be used as a tool for modelling and how they can be simulated.
	Describe the process of graduation by the following methods, and state the advantages and disadvantages.
	Explain the concepts and basic properties of autoregressive (AR), moving average (MA), autoregressive moving average (ARMA) and autoregressive integrated moving average (ARIMA) time series. Show that certain univariate time series models have the Markov property and describe how to rearrange a univariate time series model as a multivariate Markov model.
	Develop deterministic forecasts from time series data, using simple extrapolation and moving average models, applying smoothing techniques and seasonal adjustment when appropriate.
Unit 3	**Survival models**
	Define the distribution and density functions of the random future lifetime, the survival function, the force of mortality or hazard rate, and derive relationships between them. State the Gompertz and Makeham laws of mortality. Define the expected value and variance of the complete and curtate future lifetimes and derive expressions for them.
	Describe the Kaplan-Meier (or product limit) estimator of the survival function in the presence of censoring, compute it from typical data and estimate its variance.
	Describe the Nelson-Aalen estimator of the cumulative hazard rate in the presence of censoring, compute it from typical data and estimate its variance.
	Describe models for proportional hazards, and how these models can be used to estimate the impact of covariates on the hazard. Describe the Cox model for proportional hazards, derive the partial likelihood estimate in the absence of ties, and state the asymptotic distribution of the partial likelihood estimator.

	Describe and apply statistical tests of the comparison of crude estimates with a standard mortality table testing. Describe a test for smoothness of a set of graduated estimates. Carry out a comparison of a set of crude estimates and a standard table, or of a set of crude estimates and a set of graduated estimates.
Unit 4	**Mortality projection and machine learning**
	Describe the Lee-Carter, age-period-cohort, and p-spline regression models for forecasting mortality. Use an appropriate computer package to apply the models to a suitable mortality dataset. Recognise extreme value distributions, suitable for modelling the distribution of severity of loss and their relationships. Calculate various measures of tail weight and interpret the results to compare the tail weights. Describe the form and characteristics of the Gaussian copula and the Archimedean family of copulas. Derive the distribution and corresponding moments of the claim amounts paid by the insurer and the reinsurer in the presence of excesses (deductibles) and reinsurance. Estimate the parameters of a failure time or loss distribution when the data is complete, or when it is incomplete, using maximum likelihood and the method of moments. Explain the main branches of machine learning and describe examples of the types of problems typically addressed by Machine Learning. Explain in detail and use appropriate software to apply Machine Learning techniques (eg penalised regression and decision trees) to simple problems.

Teaching Pedagogy
Lectures/tutorials/field work/outreach activities/ project work/ vocational training/ viva / seminars / term papers/ assignments / presentations / self-study/case studies etc. or a combination of some of these. Sessions shall be interactive in nature to enable peer group learning.

Statistical Analysis with R programming
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
Lab work - I	20
Lab work - II	20
TOTAL	**40**

B] Semester End Examination (SEE)- 60 Marks lab work

    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** from the following		
	A. Numerical/Application-based question	20	
	OR	20	20
	B. Numerical/Application-based question		
Q-2	Attempt **any one** from the following		
	A. Numerical/Application-based question	20	20
	OR	20	
	B. Numerical/Application-based question		
Q-3	Attempt **any one** from the following		
	A. Numerical/Application-based question	20	20
	OR	20	
	B. Numerical/Application-based question		
	Total	**120**	**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 TY B. Com (Actuarial Studies) Programme
(With effect from the Academic Year 2025-2026)
2. Minor
Customer Relationship Management - I (3 Credits)

Semester V

2. Minor	
Customer Relationship Management - I	
Course Objectives and Course Outcomes	
Course Objectives	
CObj 1	To help the Learners to understand the concepts of CRM and e-CRM
CObj 2	To know the CRM practices in service sectors
CObj 3	To understand the value of a customer and the measures to be taken to retain them
Course Outcomes	
COut 1	Apply the concept of CRM, the benefits delivered by CRM, the contexts in which it is used, the technologies that are deployed and how it can be implemented.
COut 2	Implement how CRM practices and technologies enhance the achievement of marketing, sales and service objectives throughout the customer life-cycle stages of customer acquisition, retention and development whilst simultaneously supporting broader organizational goals.
COut 3	Implement various technological tools for data mining and also successful implementation of CRM in the Organizations
COut 4	Design customer relationship management strategies by understanding customers' preferences for the long-term sustainability of the Organizations.

Modules at a Glance

Sr. No.	Modules	No. of Lectures
	Customer Relationship Management - I	
1	Introduction of CRM and its Mechanics	10
2	Customer Acquisition	10
3	Customer Retention	10
	Total No. of Lectures:	**30**

Sr. No.	Modules
Unit 1	**Introduction of CRM and its Mechanics**
	i. Concept and Context of Relationship Management: Internal and External relationship management, Need and Importance of relation with customers and other stakeholders
	ii. Approach towards Marketing: A Paradigm Shift- Transition from Product focus to Customer focus, Transactional Vs Relationship Marketing, Linkage between customer satisfaction-Customer Loyalty and business performance, Relationship Management Theories, Building Brands through Relationship Marketing, Service Level Agreements.
	iii. Defining CRM, Levels of CRM, CRM as a strategic marketing tool, CRM significance to the stakeholders, Strategic CRM, Operational CRM, Analytical CRM, Collaborative CRM, and Models of CRM.
	iv. Maintaining customer database, Desirable database attributes, Data marts, Data warehousing, Data integration, Data mining and Privacy issues.
Unit 2	**Customer Acquisition**
	i. Acquisition of new customer, understanding customer value, sources of customer value, Values from products, services, people, physical evidence,

		customer communication, Channels etc., customer value estimates, KPI of a customer acquisition program, Customer Touch Points, Customer Equity.
	ii.	Conceptual frame work of Customer Relationship and its Management. Evaluation customer Relationship Marketing, Types of CRM – Win Back, Prospecting, Loyalty, Cross Sell and Up Sell, Significance and Importance of CRM in Modern Business Environment.
	iii.	Concept of Loyalty at CRM: Definition of Loyalty, Customer Loyalty and Customer decency, Process of Developing Customer Loyalty. Status of CRM in India.
Unit 3	**Customer Retention**	
	i.	Concept of Customer retention. Role of CRM in Customer in retention, Economics of customer retention, Managing customer retention or value retention/ Strategies of customer retention,
	ii.	KPI of customer retention program, Terminating customer relationship and its strategies, Concept and Significance of Customer Loyalty.
	iii.	Customer Life Cycle and Customer Life Time Value (CLTV), Recency, Frequency and Monetary Value (RFM) Analysis, Customer Loyalty Ladder, Impact Of Customer Defections, Types of Defectors, Strategies to reduce customer defections, CRM Framework- Switching.

Teaching Pedagogy

Lectures/tutorials/field work/outreach activities/ project work/ vocational training/ viva / seminars / term papers/ assignments / presentations / self-study/case studies etc. or a combination of some of these. Sessions shall be interactive in nature to enable peer group learning.

Customer Relationship Management - 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 **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

Jagdish N Sheth, Parvatiyar Atul, G Shainesh, Customer Relationship Management: Emerging Concepts, Tools and Applications, 1st Edition, Tata McGraw Hill, June 2008

Judith W .Kincaid , Customer Relationship Management Getting it Right, Pearson Education

H.Peeru Mohamed , A Sagadevan, Custmer Relationship Management, A Step by Step Approach, Vikas Publishing House

Customer Centricity –Focus on right customer for strategic advantage, by Peter Fader, Wharton Digital Press, 2012

3. General Elective (GE)/ Open Elective (OE)

Designing in Digital Marketing (3 Credits)
Semester V

3. General Elective	
Designing in Digital Marketing	
Course Objectives and Course Outcomes	
Course Objectives	
CObj 1	Provide learners with an understanding of the online customer
CObj 2	Synthesis learners with the importance of boosting sales
CObj 3	Provide learners with an understanding of unique and relevant insights
CObj 4	To enable learners to create awareness and brand value
CObj 5	Provide learners with an understanding of search engines optimization tactics to increase rating
Course Outcomes	
COut 1	The learner will be able to develop and create digital media campaigns through an understanding of e-mail, content and social media marketing
COut 2	The learner will be able to develop an approach to new business ideas.
COut 3	The learner will be able to increase the footfall for the company's website
COut 4	The learner will be able to leverage digital strategies to gain competitive advantage for business and career
COut 5	The learner will be able to reduce the prices for new customers

Modules at a Glance

Sr. No.	Modules	No. of Lectures
	Designing in Digital Marketing	
1	Introduction to digital design	11
2	Fundamentals of Marketing Graphics	11
3	Graphic designing software and tools	11
4	Recent trends and careers in designing in digital marketing	12
	Total No. of Lectures:	**45**

Sr. No.	Modules
Unit 1	**Introduction to digital design**
	- Understanding design - Meaning of graphic design and its importance - Importance of digital design - Principles of Visual communication - Shaping design and illustration - Scripting for the Web
Unit 2	**Fundamentals of Marketing Graphics**
	- Meaning, Purpose, Importance - Art and visual perception - Illustrations and case study - Image and text - Image layout and effects
Unit 3	**Graphic designing software and tools**
	- HTML/JavaScript - InDesign - Corel Draw - Typography

	● Illustrator ● Vector Graphics ● Adobe Flash ● Photoshop
Unit 4	**Recent trends and careers in designing in digital marketing**
	● Digital portfolio development ● Role of graphic designers ● Career opportunities ● Future prospects

Teaching Pedagogy

Lectures/tutorials/field work/outreach activities/ project work/ vocational training/ viva / seminars / term papers/ assignments / presentations / self-study/case studies etc. or a combination of some of these. Sessions shall be interactive in nature to enable peer group learning.

Designing in digital Marketing

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/Case- study based question B. Theory/Case- study based question C. Theory/Case- study based question D. Theory/Case- study based question	5 5 5 5	15
Q-2	Attempt **any three** of the following		
(Module-II)	A. Theory/Case- study based question B. Theory/Case- study based question C. Theory/Case- study based question D. Theory/Case- study based question	5 5 5 5	15
Q-3	Attempt **any three** of the following		
(Module-III)	A. Theory/Case- study based question B. Theory/Case- study based question C. Theory/Case- study based question D. Theory/Case- study based question	5 5 5 5	15
Q-4	Attempt **any three** of the following		
(Module-IV)	A. Theory/Case- study based question B. Theory/Case- study based question C. Theory/Case- study based question D. Theory/Case- study based question	5 5 5 5	15
	Total	**80**	**60**

Syllabus of courses of TY B. Com (Actuarial Studies) Programme
(With effect from the Academic Year 2025-2026)

4Vocational & Skill Enhancement Courses (VSEC)

4A Vocational Skill Enhancement Course

Business Communication in German-I (2 Credits)
Semester V

Vocational Enhancement Courses (VSEC)	
Business Communication in German-I	
Course Objectives and Course Outcomes	
Course Objectives	
CObj 1	To prepare young adults for German business communication
CObj 2	To prepare young adults to deal with German clients in business situations
CObj 3	To sensitise them towards the importance of learning a foreign language
CObj 4	To increase the horizon of communication
Course Outcomes	
COut 1	The learner will learn vocabulary and basic grammar for business situations
COut 2	The learner would be abreast about portraits of German companies
COut 3	The learner is able to understand basic business conversations
COut 4	The learner is equipped to writing formal Email in German

Modules at a Glance

	Business Management	
Sr. No.	**Modules**	**No. of Lectures**
1	Induction of new employee	10
2	Establishment of a new office	10
3	Official and personal work time	10
	Total No. of Lectures:	**30**

Sr. No.	Modules
Unit 1	Induction of new employee
	Business Etiquettes: conversations with colleagues and clients i. Learn about Greetings and salutations in Germany and German speaking countries. ii. Introducing oneself and others iii. Learning to spell name (semantics) iv. Name a profession v. Visiting cards format vi. Personal data and fill a personal data form vii. To understand private emails about new job and colleague viii. To close conversations ix. Contributions by German mathematical scientists: Carl Friedrich Gauss, Wilhelm Leibniz and Albert Einstein.
Unit 2	Establishment of a new office
	i. To understand articles of a noun (Grammar) ii. To name office furniture and colours iii. To fill basic details in graphics of quality analysis iv. To select and order office stationery v. To frame private emails and messages on social media
Unit 3	Official and unofficial meetings

	i.	Differences between official and unofficial clock hour
	ii.	To understand how to make official and unofficial appointments
	iii.	Vocabulary: Weekdays, months, seasons
	iv.	Grammar: Negative with nicht, preposition of time, conjunctions aber denn und oder

Teaching pedagogy

Guided listening and reading compression at individual level 2
Practicing oral skills in pairs, Discussions in group

Business Communication in German - I
Question Paper Pattern (Academic Year: 2025-2026)
Internal Examination & Semester End Examination – 50 Marks

A] Internals-20 Marks

Allocation of 40 Marks---Internal evaluation

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

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

        3) Multiple choice questions would be asked for 30 marks

        4) Evaluation of the performance would enable the learner to secure an appropriate grade

References:

DaF im Unternehmen A1 Kurs – und Übungsbuch, Klett Verlag

Project Work - I (2 Credits)
Semester V

5.A.a Project Work - I

Course Objectives and Course Outcomes	
Course Objectives	
CObj 1	Understanding the process of doing research is conducted from introduction to conclusion.
CObj 2	Learning about research methodology, literature review, data analysis and project appraisal.
Course Outcomes	
COut 1	The learners are able to formulate hypotheses and are equipped to write research papers.
Cout 2	The learner cultivates a research-oriented approach at an early age and is able to put his/her thoughts across precisely and concisely

Modules at a Glance

	Project Work - I	
Sr. No.	**Modules**	**No. of Lectures**
1	Paper Review	45
	Total No. of Lectures:	**45**

Sr. No.	Modules
1	**Paper Review**
	- Introduction to Research Paper Writing and Literature Review Introduction- In this chapter Selection and relevance of the problem, historical background of the problem, brief profile of the study area, definition/s of related aspects, characteristics, different concepts pertaining to the problem etc can be incorporated by the learner. - Research Methodology A student is expected to generate independent knowledge, ideas, and dimensions as well as distil the existing theory from the research papers listed below. - Review Papers Literature Review- This chapter will provide information about studies done on the respective issue. This would specify how the study undertaken is relevant and contribute for value addition in information/ knowledge/ application of study area which ultimately helps the learner to undertake further study on same issue. - Report and Presentation Students are expected to draft two reports based on the three research paper options as provided below.

Viva will be conducted on the day of presentations.

Nature of the examiner	Number of marks
Internal guide	20
External examiner	30
Total	**50**

Research paper review

At the end of the course, students should write a 750 words paper review on any One of the following three research papers:

1. Assessing the enabling environment for disaster risks financing – a country diagnostic toolkit, Asian Development Bank, 2020.

https://www.think-asia.org/bitstream/handle/11540/12131/disaster-risk-financing-country- diagnostics-toolkit.pdf?sequence=1

   a. An appreciation of the principles of disaster risks financing,
   b. The role of various types of insurance for disaster risks financing,
   c. A country's macro- and meso-level interventions to finance disaster risks,
   d. Tools to assess a country's macro- or public finance-readiness for disaster risk,
   e. Coordinates of the tool to assess a country's meso- or insurance industry-readiness for disaster risks: Government Policy, Economic Conditions & Support Functions, Product Availability & Affordability, Credibility of Insurance & Capital market stakeholders, Social Protection Policy, and Unlicensed & Informal Players.

2. Teaching ethics to actuaries, AF Marais, Actuarial Society of South Africa (2015).

https://actuarialsociety.org.za/convention/convention2015/wp-content/uploads/2015/10/2015-Marais.pdf

   a. Arguments for ethics education especially in the actuarial profession,
   b. An appreciation of the 'value' proposition within normative skills,
   c. A comparison of ethics education embodied in the medical and accounting professions,
   d. Sequential integration of ethics into technical subjects,
   e. Ethical dimensions: Cognitive competence, behavioral competence, managerial competence.

3. A Mathematician's Apology, G H Hardy, 1940.

https://www.math.ualberta.ca/mss/misc/A%20Mathematician%27s%20Apology.pdf

   a. Mathematics as an art and beauty as the first test of mathematics,
   b. A commentary on the great mathematicians' contributions,
   c. An appreciation of the difference between pure and applied areas,
   d. The principles underlying elegant, timeless theorems viz. Euclid's "Infinity of primes", Fermat's "Two squares theorem on primes", Pythagoras' proof of "Irrationality of √2."

   Skills that are relevant and irrelevant to pure mathematicians.

Semester VI

(With effect from the Academic Year 2025-2026)
1. Major (1.A.c Enterprise Risk Management)

Enterprise Risk Management (4 Credits)
Semester VI

1. Major	
1.A.a Enterprise Risk Management	
Course Objectives and Course Outcomes	
Course Objectives	
CObj 1	To recognize and understand various terms used in financial market services.
CObj 2	To understand the special features of the job of an actuary.
CObj 3	To identify the risk factors (micro and macro) in insurance business.
CObj 4	To acquire skills for mitigating or avoiding the risk elements.
CObj 5	To enable the learner to estimate, compute and quantify the risk elements.
CObj 6	To be aware of the features of the Indian Insurance Market.
Course Outcomes	
COut 1	The student understands the importance of actuarial services to the clients.
COut 2	The student is acquainted with various types of risks.
COut 3	The student learns how to deal with risks
COut 4	The student understands the risk environment
COut 5	The student understands the components of business environment
COut 6	The student identifies the factors determining a suitable design for financial structure
COut 7	The student learns about the importance of data requirement

	Enterprise Risk Management	
Sr. No.	Modules	No. of Lectures
1	Introduction to Actuarial Risk Management	11
2	Environmental Aspects in Actuarial Risk Management – I	11
3	Environmental Aspects in Actuarial Risk Management – II	11
4	Contract Design	12
	Total No. of Lectures:	45

Modules at a Glance

Sr. No.	Modules
1	**Introduction to Actuarial Risk Management**
	- Actuarial Stakeholders and their requirements - Actuarial Services to various Stakeholders and their Importance - Duties and Responsibilities of an Actuary in carrying out his professional job – highlighting the responsibility of giving advice and for taking decisions. - Financial and other products, schemes, contracts and other arrangements (Contingent). - Financial services: Pricing, Reserving/ Provisioning and Capital Modeling and linkages.
2	**Environmental Aspects in Actuarial Risk Management - I**
	- Business Environment for an actuary and the various components - Risk Environment – Financial Risks and Business - Concept of Systematic, Diversifiable risk and Risk Adjusted Returns in Systematic Risk. - Concept of Risk Appetite and Attainment of Risk Efficiency - Dealing with Risks: Risk Avoidance, Risk Mitigation, Risk Transfer and Risk Retention. - Portfolio approach to the overall management of risk, including Proportionality for respective stakeholders.
3	**Environmental Aspects in Actuarial Risk Management - II**

		- Regulatory Environment - Investment Environment - Demographic and Social Environment - Capital Environment - Enterprise Risk Management: An Introduction.
4	**Contract Design**	
		- Factors determining a suitable design for financial structures e.g. products, schemes, contracts or other arrangements - Nature of service e.g. Asset based (Bank Lending) and Liability based (Insurance, Deposits, Asset Management) - Use of Actuarial Techniques - Data requirement for contract designing – Problems in gathering data – Grouping of Data

Enterprise Risk 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	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

1. Financial Risk Manager Handbook: FRM Part I / Part II + Test Bank (Wiley Finance) by Philippe Jorion
2. Value at Risk, 3rd Ed. by Philippe Jorion
3. Managing Investment Portfolios: A Dynamic Process (CFA Institute Investment Series) by John L. Maginn
4. Pension Fund Risk Management: Financial and Actuarial Modeling (Chapman & Hall/Crc Finance Series) by Marco Micocci
5. Actuarial Finance: Derivatives, Quantitative Models and Risk Management by Mathieu Boudreault
6. Financial Enterprise Risk Management (International Series on Actuarial Science) by Paul Sweeting
7. Financial Enterprise Risk Management (International Series on Actuarial Science) 1st Edition by Paul Sweeting (Author)

Syllabus of courses of TY B. Com (Actuarial Studies) Programme
(With effect from the Academic Year 2025-2026)
1. Major

Ethics and Professional Standards (4 Credits)
Semester VI

1. Major	
Ethics and Professional Standards	
Course Objectives and Course Outcomes	
Course Objectives	
CObj 1	To understand significance of ethics and ethical practices in businesses which are indispensable for progress of a country
CObj 2	To learn the applicability of ethics in functional areas like actuarial practice, finance and human resource management
CObj 3	To understand the emerging need and growing importance of good governance and CSR by organizations
CObj 4	To study the ethical business practices, CSR and Corporate Governance practiced by various organizations
Course Outcomes	
COut 1	This subject offers a clear perspective of ethics and ethical framework in various functional areas like Finance, Marketing, HR of the organization which thereby paves the way for taking decisions adhering to the ethics followed the company.
COut 2	Helps students to develop an orientation towards CSR or ISR at Individual and society level
COut 3	The learner is sensitized towards the concept of giving back to society
COut 4	The learner can apply the concepts to ensure a better society
COut 5	The learner understands the role of corporate citizenship
COut 6	The learner is made aware of the pitfalls of speculation and hence emerges as a responsible investor
COut 7	The learner is sensitized towards paying appropriate taxes
COut 8	The learner is made aware of the role of regulatory bodies
COut 9	The learner is able to distinguish between right and wrong in practice

COut 10	The learner emerges as a responsible citizen

Ethics and Professional Standards		
Sr. No.	**Modules**	**No. of Lectures**
1	Introduction to Ethics and Business Ethics	11
2	Ethics in Marketing, Finance and HRM	11
3	Corporate Governance	11
4	Corporate Social Responsibility (CSR)	12
	Total No. of Lectures:	**45**

Modules at a Glance

Sr. No.	Modules
1	**Introduction to Ethics and Business Ethics**
	- Ethics: Concept of Ethics, Evolution of Ethics, Nature of Ethics- Personal, Professional, Managerial Objectives, Scope of Ethics - Business Ethics: Meaning, Objectives, Purpose and Scope of Business Ethics Towards Society and Stakeholders, Role of Government in Ensuring Business Ethics - Principles of Business Ethics, 3 Cs of Business Ethics – Compliance, Contribution and Consequences - Myths regarding Business Ethics - Ethical Performance in Businesses in India
2	**Ethics in Functional areas**
	- Ethics In Finance: Scope of Ethics in Financial Services, Ethics of a Financial Manager – Legal Issues, Balancing Act and Whistle Blower, Ethics in Taxation, Corporate Crime - White Collar Crime and Organised Crime, Major Corporate Scams in India, Role of SEBI in Ensuring Corporate Governance, Cadbury - Committee Report, 1992 - Ethics in Human Resource Management: Importance of Workplace Ethics, - Guidelines to Promote Workplace Ethics, Importance of Employee Code of - Conduct, Ethical Leadership & ethical behaviour at workplace - Environmental ethics - Ethics in actuarial practices: non divulgence of sensitive information, fair calculations, Code of conduct in practices

3	Corporate Governance
	• Concept, Principle of corporate governance Need for Corporate Governance. Significance of Ethics in Corporate Governance, Benefits and Issues in Corporate Governance • Theories- Agency Theory, Shareholder Theory, Stakeholder Theory and Stewardship Theory • Corporate Governance in India, Emerging Trends in Corporate Governance, Models of Corporate Governance, Insider Trading
4	Corporate Social Responsibility (CSR)
	• Meaning of CSR, Evolution of CSR, Types of Social Responsibility • Aspects of CSR- Responsibility, Accountability, Sustainability and Social Contract • CSR Principles and Strategies • Social Accounting • Ethical Issues in International Business Practices • Recent Guidelines in CSR • Society's Changing Expectations of Business with Respect to Globalisation • Future of CSR • corporate citizenship • implication of CSR • case study of Mahindra and Mahindra & Tata group CSR any many more

Teaching Pedagogy

Use of technology, Chalk and Talk method, Group discussions, case study analysis, Flip class, Quiz, management games would be conducted in the class to make learning an enjoyable experience.

Ethics and Professional Standards
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

1. Laura P. Hartman, Joe DesJardins, Business Ethics, Mcgraw Hill, 2nd Edition
2. C. Fernando, Business Ethics – An Indian Perspective, Pearson, 2010
3. Joseph DesJardins, An Introduction to Business Ethics, Tata McGraw Hill, 2nd Edition
4. Richard T DeGeorge, Business Ethics, Pearson, 7th Edition
5. Dr. A.K. Gavai, Business Ethics, Himalaya Publishing House, 2008
6. S.K. Mandal, Ethics is Business and Corporate Governance, McGraw Hill, 2010
7. Laura Pincus Hartman, Perspectives in Business Ethics, McGraw Hill International Editions, 1998

Syllabus of courses of TY B. Com (Actuarial Studies) Programme
(With effect from the Academic Year 2025-2026)
1.B Discipline Specific Elective

Investment Analysis (4 Credits)
Semester VI

1.B Discipline Specific Elective	
Investment Analysis	
Course Objectives and Course Outcomes	
Course Objectives	
CObj 1	Understanding of different asset classes, economic influences on assets, relationship between risk and return.
CObj 2	Understanding investment policy for Indian savings, employee benefit plans, insurance companies.
CObj 3	Analysing measures of investment risk and asset valuation.
Course Outcomes	
COut 1	Learners will learn to manage the business and financial objectives of a financial institution or an individual through an assessment of the portfolio assets and liabilities in an integrated manner.
COut 2	Learners will be able to create and interpret mathematical framework for assembling a portfolio of assets such that the expected return is maximized for a given level of risk.
COut 3	They Will learn about unitization of individual assets as well as a portfolio
COut 4	Learners will also understand the broad set of different investment avenues

Modules at a Glance

	Investment Analysis	
Sr. No.	**Modules**	**No. of Lectures**
1	Investments and markets	11
2	Investment policy in long-term savings and employee benefits	11
3	Behavioural finance for investment and measures of investment risk	11
4	Investment strategy and performance measurement	12
	Total No. of Lectures:	**45**

Sr. No.	Modules
1	**Investments and Markets**
	i. Describe the characteristics of the main investment assets and of the markets in such assets
	ii. Describe the characteristics of the main derivative investments (including forwards, futures, General properties of options and calculations of currency swaps and Interest rate swaps) and of the markets in such investments
	iii. Explain the principal economic influences on investment market price levels and total returns.
	iv. Describe and explain the theoretical and historical relationships between the total returns and the components of total returns on the main asset classes and key economic variables.
2	**Investment Policy in Long-Term Savings and Employee Benefits**
	i. Regulation and investment policy in India: banks, insurers, approved provident funds, approved superannuation (pension) funds, approved gratuity funds, mutual fund schemes, national pension scheme, overseas investment
	ii. Investment environment: Anti-money laundering, ESG (Environmental, Social and Governance), taxation of dividend and capital gains, special purpose vehicles relevant in actuarial work e.g., tax-approved superannuation funds, provident funds, gratuity funds.

	iii.	Assess the investment avenues for life insurance companies viz. participating fund, non-participating fund, pension plans, unit-linked plans, controlled fund.
	iv.	Assess the investment avenues for general insurance companies.
	v.	Assess the investment avenues for PFRDA registered pension funds.
	vi.	Explain the investment risk-seeking avenues of the special purpose vehicles in actuarial work e.g., tax-approved superannuation funds, provident funds, gratuity funds.

3	**Behavioural Finance for Investment and Measures of Investment Risk**
	1. Testing behavioural finance theories in investment decisions
	i. The herd instinct
	ii. Anchoring and adjustment
	iii. Self-serving bias
	iv. Loss aversion
	v. Confirmation bias
	vi. Availability bias
	vii. Familiarity bias.
	viii. Asset prices and their deviation
	ix. Explain the main findings of behavioral finance.
	Identify empirical examples of market anomalies that show results contrary to the EMH.
	Understand how asset prices, especially in times of uncertainty and high volatility,can deviate significantly from their fundamental values.
	2. Explain and analyse the various measures of investment risk.Variance of return

4	**Investment strategy and performance measurement**
	i. Explain how asset/liability modelling can be used to develop an appropriate investment strategy
	ii. Explain methods of quantifying the risk of investing in different classes and sub-classes of investment
	iii. Explain the use of a risk budget for controlling risks in a portfolio
	iv. Analyse the performance of an investment portfolio relative to a benchmark
	v. The greater decision between asset allocation and stock selection especially in efficient markets

| | vi. | Risk decomposition between diversifiable and non-diversifiable components |
| | vii. | Adjusted optimization techniques for risk-adjusted returns. |

Teaching Pedagogy
Use of technology, Chalk and Talk method, Group discussions, case study analysis, Flip class, Quiz, management games would be conducted in the class to make learning an enjoyable experience.

Investment Analysis
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	5	
	B. Theory/Concept-based question	5	15
	C. Theory/Concept-based question	5	
	D. Theory/Concept-based question	5	
Q-2	Attempt **any three** of the following		
(Module-II)	A. Theory/Concept-based question	5	
	B. Theory/Concept-based question	5	15
	C. Theory/Concept-based question	5	
	D. Theory/Concept-based question	5	
Q-3	Attempt **any three** of the following		
(Module-III)	A. Theory/Concept-based question	5	
	B. Theory/Concept-based question	5	15
	C. Theory/Concept-based question	5	
	D. Theory/Concept-based question	5	
Q-4	Attempt **any three** of the following		
(Module-IV)	A. Theory/Concept-based question	5	
	B. Theory/Concept-based question	5	15
	C. Theory/Concept-based question	5	
	D. Theory/Concept-based question	5	
	Total	**80**	**60**

Reference Books (with Chapters)

1. ActEd Study Material Subject CM1 2019 Actuarial Education Company, acted@bpp.com
2. ActEd Study Material Subject CM2 2019 Actuarial Education Company, acted@bpp.com
3. Derivatives Markets (3rd edition), Robert McDonald, Pearson India
4. Options, Futures and Other Derivatives, by John Hull and S. Basu, 9789352866595, Pearson Education.
5. An introduction to the mathematics of finance by McCutcheon, J. J., Scott, W. F. Heinemann, 1986.
6. Behavioural Finance, by Prasanna Chandra, ISBN 9389811287, McGraw Hill India.
7. The Behavioural Investor by Daniel Crosby, ISBN 9388423623, Jaico Publishers.
8. Pension Fund ESG Risk Disclosures: Developing Global Practice, International Actuarial Association 2020.
9. The Term Structure of Interest Rates, by Robert A. Jarrow, Annual Reviews 2009.

Syllabus of courses of TY B. Com (Actuarial Studies) Programme
(With effect from the Academic Year 2025-2026)
2. Minor

Customer Relationship Management - II (03 Credits)
Semester VI

Enhancement Course, Value Enhancement Course, Indian Knowledge System
Value Enhancement Course (VEC)
Customer Relationship Management - II
Course Objectives and Course Outcomes

Course Objectives	
CObj 1	To help the Learners to understand the concepts of CRM and e-CRM
CObj 2	To know the CRM practices in service sectors
CObj 3	To understand the values of customer.

Course Outcomes	
COut 1	Apply the concept of CRM, the benefits delivered by CRM, the contexts in which it is used, the technologies that are deployed and how it can be implemented.
COut 2	Implement how CRM practices and technologies enhance the achievement of marketing, sales and service objectives throughout the customer life-cycle stages of customer acquisition, retention and development whilst simultaneously supporting broader organizational goals.
COut 3	Implement various technological tools for data mining and also successful implementation of CRM in the Organizations
COut 4	Design customer relationship management strategies by understanding customers' preferences for the long-term sustainability of the Organizations.

Modules at a Glance

Sr. No.	Modules	No. of Lectures
	Customer Relationship Management - II	
1	Overview of CRM in B2C and B2B Market	15
2	Implementation of CRM and Future Trends in CRM	15
3	Architecture of CRM and its emerging concepts and perspectives	15
	Total No. of Lectures:	**45**

Sr. No.	Modules
1	**Overview of CRM in B2C and B2B Market**
	i. Service business characteristics and classification, Service recovery, CRM in Banking Industry, Hospitality Industry, Aviation Industry, Telecom and Retail industry. ii. CRM in Consumer durable Industry and its application. - White Goods, common CRM Tools in Practice and improvisation for Quality Service Assurance. iii. Importance of CRM in B2B markets, Key Account Management, Supply channel Management, Internal CRM and Employee relationship management
2	**Implementation of CRM and Future Trends in CRM**
	i. CRM Implementation Process, Evaluation of CRM process, Challenges in CRM implementation, Customer Care Management through Information Technology Tools – Electronic Point of Sales (ePOS) , Sales Force Automation ii. Emerging trends in CRM, Social CRM, e-CRM, Challenges involved in formulating and implementing e-CRM strategies,

	iii. Multichannel CRM, Role of Social media in CRM, Six E's of e-CRM,, Mobile CRM, Artificial Intelligence (AI) with CRM System.
3	**Architecture of CRM and its emerging concepts and perspectives**
	i. CRM Technology and Data Platforms, Database and Data Management, and the role of Business Intelligence (BI) in CRM. ii. Customer relationship management practices in Indian service sectors- Relevance of CRM for Hospital Services; Customer Relationship Management in Banking and Financial Services; CRM in Insurance Sector iii. Careers in industry iv. Introduction : A cost benefit analysis –CRM benefits, CRM Cost-customer value- customer life time value-issues in calculating CLV Customer profitability v. principles underlying the requirements of the professional standards and guidance relevant to actuaries practising in Indian health and care operations vi. Privacy, Ethics issues of CRM

Customer Relationship Management - 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 **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

- Customer Relationship Management – Concepts and Technologies by Francis Buttle, 2nd Edition, Butterworth Heinemann, Elsevier
- Relationship Management – Text and Cases, S. Shajahan, TMGH.
- J N Sheth, AtulParvatiyar, G. Shainesh, 2001, Customer Relationship Management, Tata McGraw Hill
- Customer Relationship Management: Concepts and Cases, Second Edition, Alok Kumar Rai PHI learning Pvt Ltd, New Delhi
- Handbook of Relationship Marketing by JagdishSheth and AtulParvatiyar, Response Books, Sage Publications.
- Zikmund, McLEOD, Gilbert, Customer Relationship Management
- Customer Relationship Management- Concepts and Technology, Second Edition, Francis Buttle, Elsevier, Sabre foundation
- Brown, Stanley A 2001, Customer Relationship Management, John Wiley& Sons Anderson, Kristin , 2002, Customer Relationship Management, Tata McGraw-Hill Suggested URL: 1. https://swayam.gov.in/nd2_imb20_mg09/

Syllabus of courses of TY B. Com (Actuarial Studies) Programme
(With effect from the Academic Year 2025-2026)
3. General Elective (GE)/Open Elective (OE)

Cyber Security (3 Credits)
Semester VI

3. General Elective (GE)/Open Elective (OE)	
Cyber Security	
Course Objectives and Course Outcomes	
Course Objectives	
CObj 1	To Develop understanding of core cybersecurity concepts and their application to actuarial data security
CObj 2	To learn essential cybersecurity techniques for securing actuarial data and systems
CObj 3	To foster critical thinking and problem-solving skills within the context of cyber risk management
Course Outcomes	
COut 1	Learners will be able to articulate the importance of cybersecurity in the actuarial science field and its impact on data security, risk assessments, and business continuity.
COut 2	Learners will be able to get hands-on training of essential cybersecurity tools and techniques to protect actuarial data.
COut 3	Learners will develop the ability to critically evaluate cyber risks and design secure network architectures for actuarial data processing.
COut 4	Learners will understand how to implement best practices and their benefits.

Modules at a Glance

	Investment Analysis	
Sr. No.	**Modules**	**No. of Lectures**
1	Introduction to Cyber Security	15
2	Techniques used in Cyber Security	15
3	Cyber Security Best Practices	15
	Total No. of Lectures:	**45**

Sr. No.	Modules
1	**Introduction to Cyber Security**
	• Core Security Concepts: CIA triad, Terminologies related to Security, Cyber threats and actors • Common Cyber Attacks: Phishing, Social engineering, Malware, Denial-of-service • Cyber Security Frameworks used in India • Cybersecurity in Actuarial Science: Data security in insurance, Impact of cyberattacks, Case Studies • Implementation of Actuaries in Cyber Security (Cyber Insurance)
2	**Techniques used in Cyber Security**
	• Network Security: Firewalls, Intrusion Detection/Prevention Systems (IDS/IPS), Secure network design principles • Data Encryption: Types of Encryptions, Hashing, Digital signatures • Data Access Control: User authentication, Authorization, Access control mechanisms to restrict access to sensitive data • Vulnerability Scanning: Identifying weaknesses in systems and applications used for actuarial analysis
3	**Cyber Security Best Practices**
	• Regular Audits: Types of Audits, Methodology, Reporting, Benefits • Penetration Testing: Types of Testing, Ethical Hacking, Tools used, Benefits

	- Threat Intelligence: Characteristics, Types and Tools used in CTI, Benefits - Incident Response Teams: Responsibilities, Types of IRTs, Benefits

Teaching Pedagogy

Use of technology, Chalk and Talk method, Group discussions, case study analysis, Flip class, Quiz, management games would be conducted in the class to make learning an enjoyable experience.

Cyber Security
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
Lab Work	20
Lab Work	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 E. Theory/Concept-based question	5 5 5 5 5	20
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 E. Theory/Concept-based question	5 5 5 5 5	20
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 E. Theory/Concept-based question	5 5 5 5 5	20
	Total	**75**	**60**

Reference Books (with Chapters)

- Principles of Information Security, Michael E. Whitman and Herbert J. Mattord, 7th Edition, Cengage Learning, 2021
- Hands-On Network Forensics: Network Forensics and Threat Detection, Michael T. Swartz and Christopher Eagle
- Building a Secure and Reliable Actuarial Modeling Environment by Stefan M. Jansen

Syllabus of courses of TY B. Com (Actuarial Studies) Programme
(With effect from the Academic Year 2025-2026)
4. Vocational and Skill Enhancement Course
4A Vocational Enhancement Course

Business Communication in German– II (02 Credits)
Semester VI

4. Vocational and Skill Enhancement Course
4A Vocational Enhancement Course
4.A.a Business Communication in German– II
Course Objectives and Course Outcomes
Course Objectives

CObj 1	To prepare young adults for German business communication
CObj 2	To prepare young adults to deal with German clients in business situations
CObj 3	To acquaint them with the nuisances of the language

Course Outcomes	
COut 1	Learners would have learnt vocabulary and basic grammar for business situations
COut 2	Learners would be able to understand portraits of German companies
COut 3	Leaners will be able to understand and possess basic business conversations
COut 4	Learners will be able to write business emails
COut 5	Learners will be able to communicate with their business clients

Modules at a Glance

Sr. No.	Modules	No. of Lectures
	Customer Relationship Management - II	
1	Business over lunch and visit to a client office	15
2	Celebration of milestones in a German company	15
3	Trainee: Experience in different departments	15
	Total No. of Lectures:	**45**

Sr. No.	Modules
1	**Business over lunch and visit to a client office**
	i. Planning a lunch discussion
	ii. understand and initiate a small talk on weather, family and hobbies
	iii. understand a menu card iv. select and ordering a German meal v. payment etiquette in a restaurant
2	**Celebration of milestones in a German company**
	i. To understand an invitation to company event and how to accept or decline it
	ii. To understand email about events management
	iii. To give suggestions and to make suggestions
	iv. To understand a welcome speech
	v. To understand a valedictory speech
3	**Trainee: Experience in different departments**
	i. To understand a sitemap
	ii. To understand Timetable of Transportation
	iii. To match tasks with various departments
	iv. To understand protocols
	v. To understand a travel expense report
	vi. To give and understand computer command
	vii. To answer questions during an interview
	viii. To understand a newspaper interview with a trainee

Business Communication in German- 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

           3) Multiple choice questions would be asked for 30 marks

           4) Evaluation of the performance would enable the learner to secure an appropriate grade

Reference Books

DaF im Unternehmen A1 Kurs – und Übungsbuch, Klett Verlag

Syllabus of courses of TY B. Com (Actuarial Studies) Programme
(With effect from the Academic Year 2025-2026)
5. Field Project / Apprenticeship / Community Engagement & Services
Project Work - II (2 Credits)
Semester VI

Project Work

Aim: To equip students to independently write a 4000-6000 words research paper with an actuarial or insurance or investment or pension. The paper can be either theoretical or application oriented.

The paper should comprise a) An abstract with a title and key words,

b) The definition of the idea or problem,

c) Exposition of the idea or problem,

d) Findings, and

e) Conclusion.

It is expected that the paper is supported by appropriate citations/ references, and figures/ tables.

The learner is required to select **any one topic** from the three elective options given below:

- Advanced Financial mathematics

- Investment analysis

- Life contingencies

A Model Structure of the Project Work will be shared with the learners by the Research Guide.

Project Work (Model Structure of the Project Work)
- Chapter No. 1: Introduction In this chapter Selection and relevance of the problem, historical background of the problem, brief profile of the study area, definition/s of related aspects, characteristics, different concepts pertaining to the problem etc can be incorporated by the learner.
- Chapter No. 2: Research Methodology This chapter will include Objectives, Hypothesis, Scope of the study, limitations of the study, significance of the study, Selection of the problem, Sample size, Data collection, Tabulation of data, Techniques and tools to be used, etc can be incorporated by the learner.
- Chapter No. 3: Literature Review This chapter will provide information about studies done on the respective issue. This would specify how the study undertaken is relevant and contribute for value addition in information/ knowledge/ application of study area which ultimately helps the learner to undertake further study on the same issue.

- Chapter No. 4: Data Analysis, Interpretation and Presentation This chapter is the core part of the study. The analysis pertaining to collected data will be done by the learner. The application of selected tools or techniques will be used to arrive at findings. In this, table of information's, presentation of graphs etc. can be provided with interpretation by the learner.
- Chapter No. 5: Conclusions and Suggestions In this chapter of project work, findings of work will be covered and suggestion will be enlisted to validate the objectives and hypotheses. Note: If required more chapters of data analysis can be added.
- Bibliography

- Appendix

<div align="center">OR</div>

Learners could submit a project on the basis of the internship completed by them during the undergraduate course