

PROGRAMME OUTCOMES

For every B.Sc degree program expectations are listed out by the institution under the Program Outcomes.

PO1. Knowledge and Understanding of:

1. All concepts at under graduate level.
2. Real life applications of these concepts and relationship between them.

PO2. Intellectual skills – be able to:

1. Think logically and arrange real life situations to mathematical form.
2. Assimilate knowledge and ideas based on wide reading and through the internet.
3. Transfer of appropriate knowledge and methods from one topic to another within the subject.
4. Understand the evolving state of knowledge in a rapidly developing field.

PO3. Transferable skills:

1. Use of IT (word-processing, use of internet for doing project).
2. Ability to work as part of a team.
3. Ability to use library resources/Equipment.
4. Time management.

PO4. Problem analysis:

1. Conversion of real life problem to Mathematical model and analyze with suitable Statistical tools.
2. Conduct investigations of complex problems: Use research-based knowledge.

PO5. Ethics:

1. Apply ethical principles, commit environment and responsibilities among students.

PO6. Individual and team work:

1. Function effectively as an individual and as a member in diverse teams, and in multidisciplinary settings.

PO7. Communication:

1. Communicate effectively on complex group activities and with society at large. Speak, read, write and listen clearly in person and through electronic media .

PO8. Critical Thinking:

1. Take informed actions after identifying the assumptions that frame our thinking and actions, checking out the degree to which these assumptions are accurate and valid, and looking at our ideas and decisions (intellectual, organizational, and personal) from different perspectives.

PO9. Effective Citizenship:

1. Demonstrate empathetic social concern and equity centered national development, and the ability to act with an informed awareness of issues and participate in civic life through volunteering.

PO10. Life-long learning:

1. Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes (PSO)

S. No.	Programme	PSO
1	B.Sc. (Mathematics, Statistics, Actuarial Science) (Code: BS 14)	PSO1: To understand nature, scope, basic concepts and terminology of the three courses of the programme.
		PSO2: To identify and understand the applications of the three courses in different areas like, physical sciences, life sciences, arts and humanities, Business, Insurance, various industries, etc
		PSO3: To solve various real life problems by developing mathematical model and applying various statistical tools with the help of suitable economic, finance and risk policies.
		PSO4: To develop research thinking to solve critical problems.

Suggest to follow the website: <http://www.actuariesindia.org/>

BLUE PRINT OF C.B.C.S. MODEL CURRICULUM in B.Sc Actuarial Science

Yr.	Sem & Course Theory / Lab	Title	Workload Hrs./week	Credits	Max. Marks		
					Intrnl.	Extrnl.	Tot.
I	I Sem (Course-1)	Basics of Business Economics	6Hrs	5	40	60	100
	II Sem.(Couse-II)	Basics of Financial Mathematics	6Hrs	5	40	60	100
II	II yr. Theory	III Sem :Financial Accounting	5Hrs	5	40	60	100
		IV Sem : Survival Model	4 Hrs	3	40	60	100
	II Yr. Lab	Practical-II	3Hrs	2			50
III	V Sem. Theory Paper V	Basic of Life contingencies-I	4 Hrs	3	40	60	100
	V sem. Paper V Lab	Practical on Basic Life Contingencies-I	3 Hrs	2			50
	V Sem. Theory Paper VI	Business communication	6 Hrs	5	40	60	100
	VI Sem. Theory Paper VII (Elective-1)	Life Contingencies-II	3 Hrs	2	40	60	100
	VI Sem. Lab Paper VII (Elective-1)	Practical on Life Contingencies-II	3 Hrs	2			50
	VI Sem. Theory Paper-VII (Elective-2)	Life Contingencies-III	3 Hrs	2	40	60	100
	VI Sem. Lab Paper-VII (Elective -2)	Practical on Life Contingencies-III	3 Hrs	2			50
	VI Sem. Theory Paper VIII Cluster-A1	Mortality and other actuarial statistics	3Hrs	2	40	60	100

	VI Sem. Lab Paper VIII Cluster- A1	Practical on Mortality and other actuarial statistics	3Hrs	2			50
	VI Sem. Theory Paper- VIII cluster- A2	Actuarial Statistics	3 Hrs	2	40	60	100
	VI Sem. Lab Paper VIII cluster-A2	Practical on Actuarial Statistics	3 Hrs	2			50
	VI Sem. Theory Paper VIII Cluster-B1	Principles of insurance	3Hrs	3	40	60	100
	VI Sem. Lab Paper VIII cluster-B1	Practical on Principles of insurance	3 Hrs	2			50
	VI Sem. Theory Paper VIII Cluster-B2	Practice of insurance	3Hrs	2	40	60	100
	VI Sem. Lab Paper VIII cluster-B2	Practical on Practice of insurance	3 Hrs	2			50

Course Outcomes of Actuarial Science:

S.No	Year & Sem	Paper No. & Title of the Course	Course outcomes			
1	I Year & I Sem	Course-I: Basics of Business Economics	After completion of this course, the students will be able to			
			CO 01: aware of fundamental concepts of Economics			
			CO 02: Differentiate Micro and Macro Economics			
			CO 03: Understand the concept of Elasticity of demand			
			CO 04: Apply the law of marginal utility			
			CO 05: Understand various markets and pricing			
			CO 06: Measure National Income			
			CO 07: Understand the Macro Economics policies			
			CO 08: Be aware of Insurance and Stock exchanges			
2	I Year & II Sem	Course-II: Basics Of Financial Mathematics	After completion of this course, the students are able to			
			CO 01: Realize cost and time value of money through Simple & Compound Interest			
			CO 02: Calculate EMI's for the given loans			
			CO 03: Have the knowledge on discount and weighted average rate of interest			
			CO 04: Know the columns of the mortality table and their computation			
			CO 05: Calculate premiums for various plans of insurance			
			3	II Year & III Sem	Paper-III: Financial Accounting	After completion of this course, the students are able to
						CO 01: understand the concepts of accounting and prepare the books like journals, ledgers
						CO 02: prepare final accounts of an organization
CO 03: prepare ratio analysis and funds flow statement and cash flow statement						
4	II Year	Paper-IV:	CO 04: prepare insurance claims			
			After completion of this course, the students are able			

	<p>& IV Sem</p>	<p>Survival Models</p>	<p>to</p> <p>CO 01: understand the principles of modeling and its need, benefits and limitations</p> <hr/> <p>CO 02: understand the distribution of random future lifetime and develop relation between survival function and hazard rate and understand the Gompertz and Makeham mortality laws and study and apply law of curate future lifetime random variable</p> <hr/> <p>CO 03: estimate future life distribution and understand right, left and interval censoring and construct likelihood for censored and truncated data by different models</p> <hr/> <p>CO 04: understand the advantages and disadvantages of multiple state models and find the maximum likelihood estimator of transition intensities in Binomial and Poisson models, including various criteria</p> <hr/> <p>CO 05: understand the graduation and various methods and perform goodness of test on graduate estimates and a test for comparing various estimates</p>
<p>5</p>	<p>III Year & V Sem</p>	<p>Paper-V: Basics of Life Contingencies-I</p>	<p>After completion of this course, the students are able to</p> <p>CO 01: understand meaning, types and principles of life insurance and understand the terminology of insurance premiums</p> <hr/> <p>CO 02: calculate the probabilities of age using survival functions and estimate life times and also have knowledge on life tables and analytical laws of mortality</p> <hr/> <p>CO 03: understand the concept of insurance payable at the moment of death and at the end of the year of death and relation between these.</p> <hr/> <p>CO 04: understand life annuities and commutation function and calculate life annuities immediate and due.</p>

6	III Year & V Sem	Paper-VI: Business Communication	After completion of this course, the students are able to CO 01: know the difference of verbal and no-verbal communication and have the knowledge of barriers to effective communication and also know the role of manager in communication
			CO 02: know the tips for effective communication and strategies for improving organizational communication.
			CO 03: know the tips of effective use of non-verbal communication
			CO 04: know the formal and informal communication and principles of effective business writing
7	III Year & VI Sem	Paper-VII(E-I): Life Contingencies-II	After completion of this course, the students are able to CO 01: understand net premiums and its formulae for life insurance contracts, discrete and monthly premiums
			CO 02: understand Prospective and Retrospective Reserves and their formulae and have knowledge on DSAR, EDS, ADS and Calculate net Reserves for with-profit contracts
			CO 03: Analyze benefit reverses for general insurances and fractional durations, recurrence relations for fully discrete benefit reverses
			CO 04: write life insurance contract and describe the influence of inflation on expanses and understand the gross future loss random variable
8	III Year & VI Sem	Paper-VII(E-II): Life Contingencies- III	After completion of this course, the students are able to CO 01: understand single and multiple decrement model and construct single and multiple decrement tables

			CO 02: apply multiple decrement theory to calculate present value, benefit premiums and risks and understand Markov model
			CO 03: understand discounted emerging costs, unit-linked contract, Profit test annual premium contracts, etc and determine premiums using profit test and Stochastic profit testing
			CO 04: prepare multiple decrement service table for pensions and update it and prepare funding plans, salary plans, etc
9	III Year & VI Sem	Paper-VIII(A1): Mortality and other Actuarial Science	After completion of this course, the students are able to CO 01: understand rates and ratio's in mortality and risk aggregate rates and role of multiple decrement tables in actuarial statistics
			CO 02: understand principles and purposes of graduation and graphic method
			CO 03: learn compression rates for selection, factors in mortality and population projections-Age-sex pyramid
			CO 04: study UK assured lives and annuitants mortality and Indian assured lives mortality
10	III Year & VI Sem	Paper-VIII(A2): Actuarial Statistics	After completion of this course, the students are able to CO 01: understand Warning's Result Compound Distribution an Poissonian Process – Linear Population Process
			CO 02: understand Linear Combination of Random Variables, Chebyshev's Inequality Central Limit Theorem and some Special Distributions
			CO 03: apply the method of moments for estimation of parameters and construct confidence interval for single mean and difference of means
			CO 04: apply various tests to test hypothesis for testing single and difference of means and apply chi-square tests

11	III Year & VI Sem	Paper-VIII(B2): Principles of Insurance	After completion of this course, the students are able to CO 01: learn and understand meaning of risk and distinguish between different types of risks, Risk analysis and risk management techniques, Concept of risk retention for individuals
			CO 02: learn Indian insurance market, role of intermediaries: agents, brokers, specialists: surveyors, medical examiners, third party administrators(TPA), regulator and other bodies
			CO 03: understand the concept of insured customer and his mind set, satisfaction and importance of ethical behavior
			CO 04: understand the insurance contract, significance of principle of insurable interest, principles of indemnity, subrogation and contribution, principles of utmost good faith, concept of proximate cause and terminology of life and non-life insurance
12	III Year & VI Sem	Paper-VIII(B2): Practice of Insurance	After completion of this course, the students are able to CO 01: understand the Indian insurance market, growth of insurance business in India, organizational structure of LIC.
			CO 02: understand the Concept of premium, different types of premiums and calculate premiums with various factors, concept of bonus.
			CO 03: learn and understand the various life insurance plans, importance of ULIPs, importance of riders, industrial life insurance, benefits of MWP, importance of key-man insurance, importance of health insurance.
			CO 04: understand the concept of annuity, analysis of different types of annuity plans and pros and cons
			CO 05: understand the different group insurance schemes and classifications, features of group insurance schemes, group insurance scheme in view of EDLI, social security scheme.

Model Blue Print for Actuarial Science Question paper and choice for all years (Duration: 2 ½ Hrs)

S.No.	Type of Questions	To be given in the Question paper			To be answered		
		No. of Questions	Marks allotted to each question	Total marks	No. of Questions	Marks allotted to each question	Total marks
1	<u>SECTION – A</u> Short Answer Questions	6	5	30	4	5	20
2	<u>SECTION-B</u> Essay Questions	4	10	40	2	10	20
3	<u>SECTION-C</u> Essay Questions	4	10	40	2	10	20
TOTAL		14		110	8		60

Inernal Assessment : 20 marks

QUESTION PAPER PATTERN FOR 40 MARKS (Duration: 1:15 Hrs)

S.No	Type of question	No. Of questions given	No. Of questions to be answered	Marks allotted to each question	Total Marks
1	Part-I short questions	5	5	2	10
2	Part-II Essay Questions	6	4	7½	30
Total					40
Average of Two Intraernal Assesments is taken for 20 marks					

Continuous Assessment: 20 Marks

1. Student Seminar : 5 M
2. Assingnments : 10 M
3. Task/Quiz : 5 M

Practical Exam Question paper pattern: (Duration: 2 Hrs)

Practical: Five Questions will be given.

The Student has to answer three questions.

3x12=36 M

Record: 10M

Viva: 4M

TOTAL: 50M

Note: No External evaluation for practical exam in odd sem