



Ganpat University
॥ विद्यया समाजोत्कर्षः ॥

Faculty of
Computer Applications



Programme	BCA Honors (Cyber Security)				Branch	Computer Applications			
Semester	II				Version	1.0.0.0			
Effective from Academic Year			2026-2027		Effective for the batch Admitted in			June 2026	
Subject Code	U102C4DMS		Subject Name		DISCRETE MATHEMATICS AND STATISTICAL COMPUTATION				
Teaching scheme					Examination scheme (Marks)				
(Per week)	Lecture (DT)		Practical (Lab.)		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	4		-	-	4	Theory	50	50	100
Hours	4		-	-	4	Practical	-	-	-
Objective:									
By the completion of this course, To impart knowledge of basic statistical concepts used in business and interpretation of various statistical results. Learn basic terminology formal logic, proofs, sets, relations, functions, Matrix Algebra and perform the operations associated with same. Use formal logic proof and logical reasoning to solve problems. Describe several practical applications of graph theory.									
Pre-requisites:									
Need to know about Basic concept of mathematics and statistics.									
Course Outcomes :									
Name of CO	Description								
C01	To expose students to basic Statistical concepts.								
C02	To stimulate the student's interest by showing the relevance and use of statistical knowledge and critically analyze statistical reasoning to problems of business.								
C03	The objective of this course to enable students to analyse concept of regression modelling								
C04	Relate and apply techniques for constructing mathematical proofs and make use of appropriate set operations, propositional logic to solve problems								
C05	To familiarize students with set theory, linear Algebra, functions matrices and determinants								
C06	Able to understand and apply fundamentals of graph theory in solving problems								
Mapping of CO and PO									
Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	
C01	3	2	1	0	0	0	0	1	
C02	3	3	2	1	0	0	0	1	
C03	3	3	3	1	0	0	0	1	
C04	3	3	2	0	0	0	0	1	
C05	3	2	2	0	0	0	0	1	
C06	3	3	3	0	0	0	0	1	

Content:		
Unit		Hrs

1	<p>Set, relation, function and Po-set Basic definitions of Set Theory - Methods of representation of Set, Set operations, Properties of set operations, Power set and Cardinality of sets, Venn diagram, Concept of relation, types of relation (reflexive, symmetric and transitive relation), Equivalence relation, tabular and matrix representation of relations, relations and digraphs, Definition of function, Domain, Co – domain, Range of a function Graph of a function, one-one, onto and bijective functions. Partial ordering set, comparable elements, chain, cover of element and Hasse Diagram.</p>	10
2	<p>Matrix Computation Definition, General form of matrix, types of matrices (row matrix, column matrix, null matrix, diagonal, scalar and unit matrix, upper triangular and lower triangular matrix), Transpose of matrix, singular and non-singular matrix. Matrix operations (addition, subtraction, scalar multiplication and matrix multiplication), Elementary operations on matrices, Inverse of matrix and rank of matrix, Determinant, minor and cofactor, inverse of matrix by determinant, Cramer’s rule for solving system of linear simultaneous equations.</p>	10
3	<p>Graph Theory Introduction, definition of Graph and Basic Terminology, Simple Graph, Multi Graph, Degree of a Vertex, Types of Graphs, matrix representation of graphs, Sub-graph and Isomorphic Graphs, complete graph, regular graph and bipartite graph, Directed graphs, node base, connectedness of directed graph, Tree and basic terminology, spanning tree, Hamiltonian and Eulerian graphs, Concept of colouring of graph.</p>	10
4	<p>Measures of Central Tendency Short introduction of collection of data and terms related to classification of data, Meaning of Central Tendency and measure of central tendency, Various measures of central tendency- Arithmetic mean, Geometric mean, Harmonic Mean, Median, Mode, Quartiles, Empirical relation between Mean, Median and Mode.</p>	10
5	<p>Measures of Dispersion Meaning of Dispersion or variability and measure of dispersion, Types Absolute and Relative measures of dispersion, Various measures of dispersion - Range and coefficient of range, Quartile Deviation and coefficient of quartile deviation, Mean Deviation about median and coefficient of mean deviation about median, Standard Deviation and Coefficient of variation, variance, Numerical problems based on various forms of data.</p>	10
6	<p>Correlation and Regression Analysis Meaning of bivariate data and examples. Definition of covariance, Definition of Correlation, Types of Correlation, Scatter Diagram Method, Karl Person’s Correlation Coefficients, Correlation Coefficients for Bivariate frequency distribution, Probable error for Correlation Coefficients, Rank Correlation Co- efficient.</p>	10

Practical Content:

Not Applicable

Text Books:

1	S.C.Gupta, V.K. Kapoor ; fundamental of statics; Sultan Chand & Sons.
2	Kenneth H Rosen. Discrete Mathematics and its Applications, McGraw-Hill publications, 7th edition, 2007.

Reference Books:

1	S.C.Gupta, Indra Gupta; Business Statistics; Himalaya Public House.
2	J. P. Tremblay and R.P. Manohar. Discrete Mathematical Structures with applications to Computer Science, Mc Graw Hill Ed. Inc. 1975.
3	Discrete Mathematical Structures with Application to Computer Science – Jean Paul Trembley and R Manohar, McGraw-Hill Publications
4	Engineering Mathematics (Third Edition) - Anthony Croft, Robert Davison, Martin Hargreaves - Publisher: Pearson Education
5	Discrete Mathematical Structures with Applications to Computer Science, J.P. Tremblay and RR. Manohar, Tata McGraw Hill, 2010.
6	Schaum's outlines Discrete Mathematics Graph Theory, Narsingh Deo

Web References / MOOC / Certification Course

1	www.uva.onlinejudge.org
2	www.cse.iitd.ernet.in/~bagchi/courses/discrete- book/full book.pdf
3	https://www.coursera.org/courses?query=discrete%20mathematics
4	https://www.edx.org/learn/discrete-mathematics
5	https://onlinecourses.nptel.ac.in/noc22_cs33/preview

Question Paper Scheme:

End Semester Examination Duration: (2 Hours Theory Examination)

Note for Examiner: -

Q-1 Any Five out of Seven (25 Marks)

Q-2 Any Two out of Three (06 Marks)

Q-3 Mandatory question (05 Marks)

Q-4 Any Two out of Three (08 Marks)

Q-5 Any Two out of Three (06 Marks)

The question paper must comprehensively address all Course Outcomes (COs), align Taxonomy levels, and ensure complete syllabus coverage.