

KADI SARVA VISHWAVIDYALAYA
BCA – SEMESTER - I
BCA 104 Fundamental Mathematics for Computer Science

RATIONALE:

To enhance logic by using basic concepts of mathematics such as Set theory, Permutation, Combination, Matrix Operations, Functions, Sequence, Series, Logical Reasoning and Probability.

Learning Outcomes:

1. Develop analytical and problem solving skills.
2. Compare the relevance between the introduced terminology and abstract ideas.
3. Understanding the practical applications of mathematics in solving problems of commerce, management & economics.
4. Improving logical reasoning for Competitive Exams.

Teaching and Evaluation Scheme:

Teaching Scheme would consist of classroom board based teaching, Group activity, Role play and Problem solving of relevant real time data.

The objective of evaluation is not only to measure the performance of students, but also to motivate them for better performance. Students are evaluated on the basis of internal examinations which consist of Term Work such as class test, quizzes, class participation, home assignments, presentation, Regular Attendance (i.e. Minimum 85%), Internal marks which consist of 40 (20 Term Work + 20 Sessional Exams) marks and External marks which consist of 60 for University examination.

Sr.No./ Subject Code	Subject Title	Teaching Scheme		Exam Scheme					
		Cr.	Theory/ Practical + Tut	Theory		Practical		Term Work + Sessional Marks	Total Marks
				Hrs.	Max Marks	Hrs.	Max Marks		
BCA104	Fundamental Mathematics for Computer Science	3	3 + 1	3	60	-	-	40	100

Course Content:

Unit 1:

Set Theory: [25%]

Introduction, Definition and Concepts, Representation of Sets, Different types of Sets (Definition), Set Operations using Venn diagram and examples : Union, Intersection, Difference, Symmetric Difference, Complement of Set, Laws of algebra of Set(Distributive, D' Morgan's), Cardinality of Set , Cartesian Product of Set.

No of Lectures: 12

Unit 2:

Permutation and Combination: [10%]

Introduction, Fundamental Principles of Counting, Addition Principle, Multiplication Principle, Factorial Notation, Permutation, Permutation when all objects are not distinct, Circular Permutation, Combination.

No of Lectures: 6

Unit 3:

Matrices: [25%]

Introduction, Types of Matrices, Operations on Matrices (Addition, Subtraction, Scalar, Multiplication), Computations of: Determinant, Adjoint and Inverse of Matrices.

Solution of System of Linear Equations: Cramer's Rule, Gauss Elimination Method(2x2), Matrix Inverse Method.

No of Lectures: 12

Unit 4:

Function, Sequence and Series: [20%]

Function: Definition, Domain, Co-domain, Image, Range, Types of Functions (One - One, Many - One, Onto, Into, Composite, Inverse, Floor, Ceiling, Recursive)

Sequences: What is sequence? , Types of Sequences, Arithmetic Progression, Geometric Progression.

Series: Definition, Difference between sequences and series, Types of Series, Arithmetic Series.

No of Lectures: 10

Unit 5:

Logical Reasoning and Probability [20%]

What is logical Reasoning?, Logical Reasoning for Number Series, Letter Series and Symbol Series. Probability: Mathematical and Statistical Definition of Probability, Simple Probability and its Rules (Addition, Multiplication)

No of Lectures: 7

Total No of Theory Lectures: - 47 Hrs.

References:

1. Advanced Mathematics: By Heena Timani – Books India Publication
2. Discrete Mathematical Structure [3rd Ed.]: By Bernardkolman, Robert C. Busby And Sharon Roass - Prentice Hall Of India
3. The Essence Of Mathematics For Business : By H.A.Spooner And D.A.L.Wilson – Prentice Hall Of India.
4. Business Mathematics: By J.K Singh - Himalaya Publications
5. Financial Mathematics: By A. Lenin Jothi - Himalaya Publications
6. Statistics: By S.P Gupta

Instructional Strategies:

1. Bridge course to sharpen the existing knowledge.
2. Classroom teaching with variants to make mathematics easy to learn.
3. Integrate topics and concepts.
4. Independent Practice to develop the art of self learning.
5. Demonstration using technology tools.
6. Provide examples to transfer learning.
7. Problem solving of relevant real time data.

Teaching and Examination Scheme

UNIT	Examination Scheme % weight age	Teaching Scheme No of Lecture
Unit 1	25	12
Unit 2	10	06
Unit 3	25	12
Unit 4	20	10
Unit 5	20	07
Total	100	47