



GUJARAT UNIVERSITY

BCA I SYLLABUS

COURSE TITLE	Fundamental Mathematical Concepts
COURSE CODE	CC-104
COURSE CREDIT	3
Session Per Week	4
Total Teaching Hours	40 HOURS

AIM

This course aims to provide student with the knowledge and skills necessary to interpret and use basic mathematical data, symbols and terminology useful in computer science. The knowledge of the subject forms the base of computer science.

LEARNING OUTCOMES

On the completion of the course students will:

1. Understand concepts of Set Theory, Coordinate Geometry, Matrix Algebra and Calculus
2. Solve simple application problems related to Computer Science based on these.

DETAIL SYLLABUS

UNIT	TOPIC / SUB TOPIC	TEACHING HOURS
1	Set Theory and Functions	10
	• Basic definition of Set Theory • Methods of representation of Set (Property method, Listing method)	1
	• Set operations (Union, Intersection, Complement of a set, Difference of sets, Symmetric difference, Cartesian product of sets)	2
	• Properties of set operations (Commutative, Associative, Distributive, De-Morgan's laws) • Power set and Cardinality of sets	2
	Functions	
	• Introduction of Functions • Definition of function • Domain, Co-domain and Range of a function	1
	• Types of functions(Linear, Quadratic, Polynomial, Implicit and Explicit functions and examples related with it)	2
	• Exponential and Logarithmic with their properties and related examples, Introduction to Trigonometric functions	2

2	Matrices and Determinants	10
	<ul style="list-style-type: none"> • Definition of Matrix • Types of Matrix (Square, Row, Column, Zero, Diagonal, Scalar, Identity, Transpose, Symmetric, Skew-symmetric) 	2
	<ul style="list-style-type: none"> • Arithmetic operations of Matrices (Addition, Scalar Multiplication, Matrix Multiplication) 	3
	<ul style="list-style-type: none"> • Introduction to Determinants with Basic properties • Invertible matrix 	1
	<ul style="list-style-type: none"> • Computation of Inverse using Definition • Simultaneous Solution of set of Linear equations using Cramer's Rule • Matrix inversion method • Rank of Matrix 	4
3	Co-ordinate Geometry	10
	<ul style="list-style-type: none"> • Introduction to Co-ordinates • Quadrants and Lines • Distance formula in R² (without proof) 	2
	<ul style="list-style-type: none"> • Section formula (without proof) 	1
	<ul style="list-style-type: none"> • Area of triangle (without proof) and related example 	2
	<ul style="list-style-type: none"> • General Equation of a straight line • Slope and intercepts of a line 	2
	<ul style="list-style-type: none"> • Parallel Lines • Perpendicular Lines • Angle between two lines (without proof) and related examples 	3
	Simple examples should be asked for above concepts	
4	Limit, Differentiation and Integration	10
	<ul style="list-style-type: none"> • Limit <ul style="list-style-type: none"> o Concept of Limit o Some standard Limits (without proof) o Continuity of a function and related examples 	2
	<ul style="list-style-type: none"> • Differentiation <ul style="list-style-type: none"> o Definition of Derivative o Rules for Differentiation (without proof) o Differentiation of composite functions o Higher order derivatives till order 2 	5
	<ul style="list-style-type: none"> • Integration <ul style="list-style-type: none"> o Introduction to indefinite integral o Definition of Integration & Methods of integration o Substitution Methods o Some standard Formulae (without proof) and example based on the standard forms o Introduction to definite integration and simple examples on it 	3

TEXT BOOK/S:

Business Mathematics (Latest Edition)
Publisher : S.Chand and Sons Publications
By: D.C. Sancheti & V.K Kapoor

REFERENCE BOOKS:

Elementary Engineering Mathematics
Publisher : Khanna publisher
By : BS. Grewel