



C. U. Shah University, Wadhwan City

Faculty of Computer Science

Name of Program: Bachelor of Computer Application (BCA) Semester : II

W.e.f. June-2014

Teaching & Evaluation Scheme

Sr. No	Subject Code	Subject Name	Teaching Hours/Week				Credits	Evaluation Scheme/Semester							
			Th	Tu	Pr	Total		Theory				Practical			Total Marks
								Sessional Exam		University Exam		Internal		Uni	
								Marks	Hrs	Mark	Hrs	Pr	TW	Pr	
2	4CS02BCO1	Computer Oriented Numerical Methods	4	-	-	4	4	30	1.5	70	3	-	-	-	100

Objectives: To impart the numerical mathematical solution techniques.

Pre-requisites: A basic understanding of Mathematical techniques.

Ch. No.	Chapter Name	Chapter Topics	Total Hrs.
1	Linear system of equation	Solution of linear equation using direct methods Gauss –elimination method, Gauss- Jordan method, Gauss-Jacobi method, Gauss-Seidal method	5
2.	Finite difference & Interpolation	Definition, finite- difference forward- difference table backward-difference table, Newton’s forward difference formula, Newton’s backward difference formula, Langrage’s interpolation	8
3.	Solution of Algebraic and Transcendental equations	Iterative Methods for finding roots, Bisection method, False Position method, Secant Method, Newton Raphson method	5
4.	Numerical Integration	Newton-cotes quadrature formula, Trapezoidal, Simpson’s 1/3, Simpson’s 3/8	5
5.	Numerical solution of ordinary differential equations	Introduction, Euler’s method, Runge-kutta methods	5
6.	Relations & Ordering	Introduction, Relations, Relation in a set, Binary relation in a set, Domain and range of a relation Total no. of distinct relation from a set A to B, graph of relations, Relations and sets of Ordered pairs, Types of relations in a set, Properties of relations in a set, Equivalence Relation, More example on relations, Equivalence classes or Equivalence sets, Partitions, Partial Order Relations, Hasse diagram, Upper and Lower Bounds, Minimal, Maximal element , Binary Operations, Closure Operation	5
7.	Posets & Lattices	Introduction, Posets, Lattices as Posets, Lattices as algebraic systems, Sublattices, Complete Lattices Bounds of Lattices, Modular and distributive lattices, Complemented Lattice, Chains	5
8.	Boolean Algebra	Introduction, Definition and important properties, Subboolean Algebra, Atoms, Anti atoms Irreducible Stone’s representation theorem, Boolean Expression and their equivalence, Min terms and max terms Values of Boolean expressions and Boolean Functions	9
9.	Graph Theory	Introduction to graph, abstract definition of Graph, Isomorphism, Matrix representation of Graphs Path, Reachability, Connectedness, Node base, Trees, Definitions of basic terms related to trees and Binary trees	9
Total::			55

**Teaching Methodology:**

Revision, Paper Solving, Seminar, Expert Talk, MCQ Quiz, Viva Test, Programming Test

**Learning Outcomes:**

After the successful completion of the course, students will be able to solve algebraic and transcendental equations, system of linear equations and differential equations by numerical methods. Understand the basic concepts of Discrete Mathematics and its applications.

**Books Recommended:**

1. "Computer Oriented Numerical Methods", V. Rajaraman, PHI Publication (3<sup>rd</sup> Edition)
2. Discrete Mathematical Structure (Third Edition), Bernard Kolman, Robert C. Busby, Sharon Roass :, Prentice Hall Of India Pvt. Ltd.

**Reference Books:**

1. "Numerical Method" E. Balagurusamy, TMH Publication (7<sup>th</sup> Edition)
2. "Computer Oriented Numerical Methods", R.S. Salaria, Khanna Book Publication (4<sup>th</sup> Edition)
3. Discrete Mathematics And Its Applications, Tata Mcgraw Hill ( 5<sup>th</sup> Edition) , , Kenneth .H. Rosen