

LIST OF ELECTIVE PAPERS IN BCA COURSE -2019

S.NO	SEMESTER	PAPER CODE	COURSE/SUBJECT
1	2nd	BCA-S110-E1	Fundamentals of Discrete Mathematics
		OR	
		BCA-S110-E2	Mathematics-II
2	4th	BCA-S210-E1	Graph Theory & Combinatorics
		OR	
		BCA-S210-E2	Mathematics-III
3	5th	BCA-S304-E1	Software Project Management
		OR	
		BCA-S304-E2	Numerical Methods

Note : In BCA 2nd, 4th and 5th Semesters, The students need to opt either E1 or E2 as elective.

w.e.f. Session (2019-20)



Bachelor of Computer Applications

Course Code	Course Name	L T P C
BCA-S110-E1	Fundamentals of Discrete Mathematics	4 0 0 4

UNIT-I: INTRODUCTION TO BOOLEAN LOGIC

Statements and Notation, Connectives, Negation, Conjunction, Disjunction, Statement formulas and Truth tables. Conditional and Biconditional, Tautologies, Contradictions, WFF, Equivalence of formulae, Duality law, Two state Devices and Statement Logic.
Normal forms, Disjunctive Normal Forms, Conjunctive Normal forms

UNIT-II: SETS AND ELEMENTS

Sets and Elements, Equality of Sets, Subsets, Set operations, Venn Diagrams & Set operations, Fundamentals products, Algebra of Sets, Duality, Finite Sets, Counting Principles, Classes of Sets, Induction, Symmetric Difference.

UNIT-III: RELATIONS

Relations, Representation of Relations, Compositions of Relations, Types of Relations, Equivalence Relations, Partial Ordering Relation, Functions: Function, Mapping, Real valued, Composition, One to One, Onto, Invertible, and the Cardinality of a set.

UNIT-IV: GRAPHS

Basic Concepts: Graphs, Incidence and degree, Isomorphism, Sub graphs and Union of graphs, connectedness, Walks, Paths and Circuits, Euler's Formula, Eulerian graph, Hamiltonian graph, Chromatic Graphs, Planer Graphs, Travelling salesman problem, Complete, Regular and Bipartite graphs, Directed Graphs

UNIT-V: TREES

Basic Concepts: Trees and their properties, Binary Tree, Traversing Binary Tree, Complete and Extended Binary Tree, Directed Tree, Depth first search algorithm

TEXT BOOKS

1. J.P Tremblay, R. Manohar, Discrete Mathematical Structures with Application of Computer Science, Tata McGraw Hill.
2. Seymour Lipschutz, Discrete Mathematics, McGraw Hill.

REFERENCES

1. Joe I. Mott, Abraham Kandel, Theodore P. Baker, Discrete Mathematics for Computer Scientists and Mathematicians, PHI.
2. Narsingh Deo, Graph Theory, PHI
3. V.K. Balakrishnan, Graph Theory, Tata McGraw Hill.

Bachelor of Computer Applications

Course Code	Course Name	L T P C
BCA-S210-E1	Graph Theory and Combinatorics	4 0 0 4

UNIT I : INTRODUCTION

Brief History of Graph Theory – Application of Graph – Finite and Infinite Graphs- Matrix representations, degree, operations on graphs, Isolated Vertex, Pendant Vertex and Null Graph.

UNIT II : TREES, CONNECTIVITY & PLANARITY

Spanning trees – Fundamental circuits – Spanning trees in a weighted graph – cut sets – Properties of cut set – All cut sets – Fundamental circuits and cut sets – Connectivity and separability – Network flows – 1-Isomorphism – 2-Isomorphism – Combinational and geometric graphs.

UNIT III: MATRICES, COLOURING AND DIRECTED GRAPH

Chromatic number – Chromatic partitioning – Chromatic polynomial – Matching – Covering – Four color problem – Directed graphs – Types of directed graphs – Digraphs and binary relations – Directed paths and connectedness.

UNIT IV: PERMUTATIONS & COMBINATIONS

Fundamental principles of counting – Permutations and combinations – Binomial theorem – combinations with repetition – Combinatorial numbers – Principle of inclusion and exclusion – Derangements – Arrangements with forbidden positions.

UNIT V: GENERATING FUNCTIONS

Generating functions – Partitions of integers – Exponential generating function – Summation operator – Recurrence relations – First order and second order – Non-homogeneous recurrence relations – Method of generating functions.

TEXT BOOKS:

1. Narsingh Deo, "Graph Theory: With Application to Engineering and Computer Science", Prentice Hall of India, 2003.
2. Grimaldi R.P. "Discrete and Combinatorial Mathematics: An Applied Introduction", AddisonWesley, 1994.

REFERENCES:

1. Clark J. and Holton D.A, "A First Look at Graph Theory", Allied Publishers, 1995.
2. Mott J.L., Kandel A. and Baker T.P. "Discrete Mathematics for Computer Scientists and Mathematicians", Prentice Hall of India, 1996.
3. Liu C.L., "Elements of Discrete Mathematics", Mc Graw Hill, 1985.
4. Rosen K.H., "Discrete Mathematics and Its Applications", Mc Graw Hill, 2007.

Bachelor of Computer Applications

Course Code	Course Name	L	T	P	C
BCA-S304-E1	Software Project Management	3	1	0	4

UNIT I : INTRODUCTION TO SOFTWARE PROJECT MANAGEMENT

Project Definition – Contract Management – Activities covered By Software Project Management – Overview of Project Planning – Stepwise Project Planning.

UNIT II : PROJECT EVALUATION

Strategic Assessment – Technical Assessment – Cost Benefit Analysis –Cash Flow Forecasting – Cost Benefit Evaluation Techniques – Risk Evaluation.

UNIT III : ACTIVITY PLANNING

Objectives – Project Schedule – Sequencing and Scheduling Activities –Network Planning Models – Forward Pass – Backward Pass – Activity Float – Shortening Project Duration – Activity on Arrow Networks – Risk Management – Nature Of Risk – Types Of Risk – Managing Risk – Hazard Identification – Hazard Analysis – Risk Planning And Control.

UNIT IV : MONITORING AND CONTROL

Creating Framework – Collecting The Data – Visualizing Progress – Cost Monitoring – Earned Value – Prioritizing Monitoring – Getting Project Back To Target – Change Control – Managing Contracts – Introduction – Types Of Contract – Stages In Contract Placement – Typical Terms Of A Contract – Contract Management – Acceptance.

UNIT V : MANAGING PEOPLE AND ORGANIZING TEAMS

Introduction – Understanding Behavior – Organizational Behaviour: A Background – Selecting The Right Person For The Job – Instruction In The Best Methods – Motivation – The Oldham – Hackman Job Characteristics Model – Working In Groups – Becoming A Team –Decision Making – Leadership – Organizational Structures – Stress –Health And Safety – Case Studies.

TEXT BOOKS

1. Bob Hughes, Mike Cotterell, "Software Project Management", Third Edition, Tata McGraw Hill, 2004.

REFERENCES

1. Ramesh, Gopaldaswamy, "Managing Global Projects", Tata McGraw Hill, 2001.
2. Royce, "Software Project Management", Pearson Education, 1999.
3. Jalote, "Software Project Management in Practice", Pearson Education, 2002.