

BHAVAN'S VIVEKANANDA COLLEGE

OF SCIENCE, HUMANITIES AND COMMERCE

(Reaccredited with 'A' grade by NAAC)

Autonomous College

Affiliated to Osmania University



**Bharatiya Vidya
Bhavan**

Board of Studies

DEPARTMENT OF COMPUTER SCIENCE

BCA - (CBCS)

w.e.f 2023-2024

P.V. Sridhar

Board of Studies OU Nominee

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N. B. Shyam

Chairperson & Head of the Department

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**Bhavan's Vivekananda College
Sainikpuri**

Bhavan's Vivekananda College

Department of Computer Science

Sainikpuri, Secunderabad

Autonomous College – Affiliated to Osmania University

BCA I Year

CBCS (Choice Based Credit System) w.e.f. 2023-2024

Scheme of Instruction and Examination

SEMESTER – I

Sl.No.	Code	Paper Title	Course Type	PPW		Max. Marks		Max. Marks		Credits
				TH	PR	TH	TH-CIA	PR	PR - CIA	
1	BCA141	Mathematical Foundations of Computer Science	BSC	4		70	30			4
2	BCA142	Digital Principles	PCC	4		70	30			4
3	BCA143	Programming in C	PCC	4		70	30			4
4	BCA144	Introduction to Web Technology	PCC	4		70	30			4
5	BCA145	Effective Communication	HSC	4		70	30			4
6	BCA143P	Programming in C Lab	LCC		4			50	25	2
7	BCA144P	Web Technology Lab	LCC		4			50	25	2
8	BCA146P	IT Workshop	LCC		4			50	25	2
Total				20	12	350	150	150	75	26

BSC : Basic Science Course

PCC : Professional Core Course

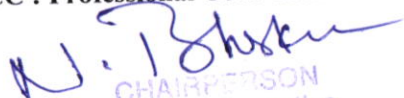
HSC : Humanities and

Social Science Course

LCC : Laboratory Core

Course

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Department of Computer Science

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BCA I Year

CBCS (Choice Based Credit System) w.e.f. 2023-2024

Scheme of Instruction and Examination

SEMESTER – II

Sl.No.	Code	Paper Title	Course Type	PPW		Max. Marks		Max. Marks		Credits
				TH	PR	TH	TH-CIA	PR	PR - CIA	
1	BCA241	Fundamentals of Probability and Statistics	BSC	4		70	30			4
2	BCA242	Object Oriented Programming using CPP	PCC	4		70	30			4
3	BCA243	Computer Architecture	PCC	4		70	30			4
4	BCA244	Data Structures	PCC	4		70	30			4
5	BCA245	Advanced Computer Networks	PCC	4		70	30			4
6	BCA242P	Object Oriented Programming using CPP Lab	LCC		4			50	25	2
7	BCA244P	Data Structures Lab	LCC		4			50	25	2
8	BCA246P	Communication Skills Lab	LHC		4			50	25	2
Total				20	12	350	150	150	75	26

BSC : Basic Science Course

PCC : Professional Core Course

LHC : Laboratory

Humanities Course

LCC : Laboratory Core

Course

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DEPARTMENT OF COMPUTER SCIENCE
PROGRAM NAME: BCA
COURSE NAME: MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE
(w.e.f 2023-24)

PAPER CODE: BCA141
YEAR/SEMESTER: I/I

PPW: 4
NO. OF CREDITS: 4

COURSE OBJECTIVE: Students acquire knowledge on basic mathematics to their computer related applications.

UNIT-WISE COURSE OBJECTIVES:

COB1: To familiarize the students with concepts of propositions, logic, truth tables and set theory.

COB2: To familiarize the students with concepts of relations and functions.

COB3: To familiarize the students with concepts of generating functions and recurrence relations.

COB4: To familiarize the students with concepts of algebraic structures.

COB5: To familiarize the students with graph theory.

UNIT-I

Fundamentals of Logic: Basic Connectives and Truth Tables, Logical Equivalence, Logical Implication, Use of Quantifiers, Definitions and the Proof of Theorems. Set Theory: Set and Subsets, Set Operations, and the Laws of Set theory, Counting and Venn Diagrams. Properties of the Integers: The well – ordering principle, Recursive Definitions, Division Algorithms, Fundamental theorem of Arithmetic.

(Book 1 – Chapters - 1, 2, 3)

UNIT-II

Relations and Functions: Cartesian Product, Functions onto Functions, Special Functions, Pigeonhole Principle, Composition and Inverse Functions. Relations: Partial Orders, Equivalence Relations and Partitions. Principle of Inclusion and Exclusion: Principles of Inclusion and Exclusion, Generalization of Principle.

(Book 1 – Chapters - 2, 5, 7)

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UNIT-III

Generating Functions: Introductory Examples, Definition and Examples, Partitions of Integers. Recurrence Relations: First – order linear recurrence relation, second – order linear homogenous recurrence relation with constant coefficients.

(Book 1 – Chapter - 6)

UNIT-IV

Algebraic Structures: Algebraic System – General Properties, Semi Groups, Monoids, Homomorphism, Groups, Residue Arithmetic. (No theorem proofs)

(Book 1 – Chapter - 11)

UNIT-V

Graph Theory: Definitions and examples, sub graphs, complements and graph Isomorphism, Vertex degree, Planar graphs, Hamiltonian paths and Cycles. Trees: Definitions, properties and Examples, Rooted Trees, Spanning Trees and Minimum Spanning Trees.

(Book 1 – Chapters – 8, 9)

Suggested Reading:

1. Kenneth H Rosen, “Discrete Mathematics and its Applications with Combinators and Graph Theory”, 7th Edition, 2017.
2. Mott Joe L Mott, Abraham Kandel, and Theodore P Baker, Discrete Mathematics for Computer Scientists & Mathematicians, Prentice Hall NJ, 2nd Edition, 2015.
3. Jr. P. Tremblay and R Manohar Discrete Mathematical Structures with Applications to Computer Science, McGraw Hill, 1987.
4. R.K.Bisht and H.S.Dhami, Discrete Mathematics Oxford Higher Education, 2015.
5. Bhavanari Satyanarayana, Tumurukota Venkata Pradeep Kumar and Shaik Mohiddin Shaw, Mathematical Foundation of Computer Science, BSP, 2016.
6. Ralph P. Grimaldi Discrete and Combinatorial Mathematics, 5th Edition, Pearson, 2004.

COURSE OUTCOMES:

At the end of the course students will be able to:


BCA141 CO1: Learn the concepts of logics and be familiarized with set theory.


BCA141 CO2: Learn the concepts of logics and laws of Boolean Algebra.

BCA141 CO3: Learn the concepts of generating functions and recurrence relations.

BCA141 CO4: Understand the concepts of groups.

BCA141 CO5: Understand graph theory which is of great use in computers.


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DEPARTMENT OF COMPUTER SCIENCE
PROGRAM NAME: BCA
COURSE NAME: DIGITAL PRINCIPLES
(w.e.f 2023-24)

PAPER CODE: BCA142
YEAR/SEMESTER: I/I

PPW: 4
NO. OF CREDITS: 4

COURSE OBJECTIVE: This course is intended to teach the basics involved in data representation, digital logic circuits, combinational and sequential logic circuit design used in the computer system.

UNIT-WISE COURSE OBJECTIVES:

COB1: To understand the digital representation of data in a computer system and logic gates

COB2: To explain logic elements and their use in combinational circuit design

COB3: To explain logic elements and their use in sequential logic circuit design.

COB4: To understand the general concepts in registers and counters.

COB5: To explain asynchronous sequential circuits, analysis and design procedures

UNIT-I

Binary Systems: Digital Systems, Binary Numbers, Number Base Conversions, Octal and Hexadecimal Numbers, Complements, Signed Binary Numbers, Binary Codes, Binary Storage and Registers, Binary Logic.

Boolean Algebra and Logic Gates: Basic Theorems and Properties of Boolean Algebra, Boolean Functions, Digital Logic Gates.

(Book 1 – Chapters – 1, 2)

UNIT-II

Minimization: K-Map Method –POS - SOP, Don't care conditions, NAND, NOR Implementation.

Combinational Logic: Combinational Circuits, Analysis and Design Procedure, Binary Adder, Binary Subtractor, Decimal Adder, Decoders, Encoders, Multiplexers.

(Book 1 – Chapters – 3, 4)

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UNIT-III

Synchronous Sequential Logic: Sequential Circuits - Latches, Flip-Flops: (D, SR, JK, T flip flop), Analysis of Clocked Sequential Circuits (state table, state diagram, flip flop input equations, analysis with Flip Flops), Design Procedure.

(Book 1 – Chapter – 5)

UNIT-IV

Registers and Counters: Registers (Register with parallel load), Shift Registers (Serial Transfer, Serial Addition, Universal shift register), Ripple Counters (Binary, BCD), Synchronous Counters (Binary, Up-Down, BCD, Binary Counter with Parallel Load), Other Counters (Ring Counters, Johnson Counter).

(Book 1 – Chapter – 6)

UNIT-V

Asynchronous Sequential Circuit: Introduction- block diagram, Analysis Procedure (transition table, flow table, race conditions), Circuits with Latches (SR latch, Analysis Example, Implementation Example), Design Procedure (Design Example, Primitive Flow Table).

(Book 1 – Chapter – 9)

Suggested Reading:

1 M.Morris Mano, “Digital Design”, 6th edition, Pearson Education, Delhi, 2018.

2 Donald P Leech, Albert Paul Malvino and Goutam Saha, “Digital Principles and Applications”, Tata Mc Graw Hill, 2007.

COURSE OUTCOMES:

At the end of the course students will be able to:


BCA142 CO1: Acquire knowledge on digital representation of data in a computer system

BCA142 CO2: Analyze the general concepts in combinational circuit design

BCA142 CO3: Explain logic elements and their sequential logic circuit design.

BCA142 CO4: Analyze the general concepts in registers and counters.

BCA142 CO5: Work on asynchronous sequential circuits, analysis and design procedure.


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DEPARTMENT OF COMPUTER SCIENCE
PROGRAM NAME: BCA
COURSE NAME: PROGRAMMING IN C
(w.e.f 2023-24)

PAPER CODE: BCA143
YEAR/SEMESTER: I/I

PPW: 4
NO. OF CREDITS: 4

COURSE OBJECTIVE: To enable students with the concepts of C programming to develop simple applications.

UNIT-WISE COURSE OBJECTIVES:

COB1: To introduce C Language, Data Types, and Variables & Operators and Conditional Control Statements.

COB2: To illustrate different Looping Statements and explanation of Functions and Storage Classes.

COB3: To explain the usage of arrays and Preprocessor Commands.

COB4: To understand the concepts of Pointers and Strings.

COB5: To discuss the concepts of Structures, Unions, Input and Output using files.

UNIT – I

Introduction to Computers: Algorithms, Flowcharts.

Introduction to C Language: C Programs, Structure of a 'C' program, Comments, Identifiers, Data Types, Variables, Constants, Input / Output Statements.

Operators and Expressions: Operators, Evaluating Expressions, Precedence and Associativity of Operators, Type Conversions.

Conditional Control and branching: if, if-else, switch-statement.

(Book 1- Chapters - 1, 2, 3, 5)

UNIT-II

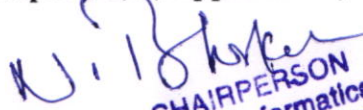
Loop Control Statements: for, while, do-while and examples, continue and break


Functions: Function basics, User-defined functions, Standard functions (math functions), Methods of Parameter passing.

Recursion: Iterative functions, Recursive functions, Iterative vs Recursive functions.

Storage classes: auto, register, static, extern.

(Book 1 - Chapters 6, 4, Appendix: J)


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UNIT – III

Arrays: Concepts, Using Arrays in C, Declarations and Definitions, Accessing elements in Array, Storing values in arrays, Two Dimensional Arrays, Declaration, Linear Search, Binary Search, Selection Sort, Bubble Sort.

Pre-processor: Pre-processor Commands (#include, #define).

(Book 1 – Chapter - 8)

UNIT - IV

Pointers: Introduction, Declaring, Assigning and Accessing Pointer variables, Pointers to Pointers, Arrays and Pointers, Pointer Arithmetic and Arrays, Passing an Array to Function, Memory Allocation functions, Array of Pointers.

Strings: Concepts, C Strings, String Input/Output Functions, Array of String, String Manipulation Functions (Built-in).

(Book 1- Chapters - 9, 10, 11)

UNIT - V

Structures: Definition and Initialization of Structures, Accessing Structures, Nested Structures, Arrays of Structures, Unions: Referencing Unions, Initializers, Unions and Structures, the Type definitions (typedef), Enumerated types.

Text input / output: Introduction to Files, Modes of Files, Streams, Standard Library Input / Output Functions, File Open and Close, Character Input/Output Functions.

(Book 1 – Chapters - 12, 7)

Suggested Reading:

1. Behrouz A. Forouzan and Richard F. Gilberg, Computer Science: A Structured Approach Using C, 4/e, Cengage Learning 2023.
2. Brain W. Kernighan and Dennis Ritchie, "The C Programming Language", Pearson Edition, 2015.
3. V. Rajaraman and Neeharika Adabala, "the fundamentals of Computers", 6th Edition, Prentice -Hall of India, 2014

COURSE OUTCOMES: At the end of the course students will be able to:

BCA143 CO1: Develop Simple 'C' Programs.

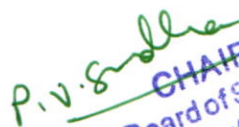
BCA143 CO2: Implement different Looping Control Statements and Functions.

BCA143 CO3: Program the concepts of Arrays and Preprocessor Commands.

BCA143 CO4: Apply the concepts of Pointers and Strings.

BCA143 CO5: Implement Structures, Unions and Input and Output using files.


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DEPARTMENT OF COMPUTER SCIENCE
PROGRAM NAME: BCA
COURSE NAME: PROGRAMMING IN C LAB
(w.e.f 2023-2024)

PAPER CODE: BCA143P

YEAR/SEMESTER: I/I

COURSE OBJECTIVE: To enable students with the concepts of C programming to develop basic applications.

COB1: To illustrate different Operators, Control Statements, Functions, Arrays.

COB2: To demonstrate the concepts of Pointers, Strings, Structures, Unions, Input and Output using Files.

1. Review the concepts (Computer Systems, Computing environments, computer Languages, Creating and running programs, software development process) and submit the assignment.
2. Write programs using arithmetic, logical and ternary operators.
3. Write a program to demonstrate Roots of a Quadratic Equation.
4. Write a program to demonstrate extracting digits of integers.
5. Write a program to demonstrate reversing digits.
6. Write a program to demonstrate finding sum of digit.
7. Write a program to demonstrate printing multiplication tables.
8. Write a program to demonstrate Armstrong numbers.
9. Write a program to demonstrate checking for prime.
10. Write a program to display the sum of the series $1 + 1/x + 1/x^2 + 1/x^3 + \dots + 1/x^n$.
11. Write a program to demonstrate the Conversion of Binary to Decimal, Octal, Hexadecimals.
12. Write a program to Generating a Pascal triangle and Pyramid of numbers
13. Write a program to demonstrate Factorial, Fibonacci, GCD using Recursion
14. Finding the maximum, minimum, average and standard deviation of given set of numbers using arrays
15. Write a program to reverse an array,removal of duplicates from array
16. Write a program to Matrix addition, multiplication and transpose of a square matrix using functions.
17. Write a program to demonstrate pointers and malloc function.

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18. Write a program to perform string manipulation using string functions such as strlen(),strcat(), strcpy(), etc.
19. Finding the No. of characters, words and lines of given text file.
20. Write a program to demonstrate Text Files.

COURSE OUTCOMES: At the end of the course students will be able to:

BCA143P CO1: Develop simple 'C' programs using Operators, Control statements, Functions, Arrays.

BCA143P CO2: Implement different operations on Pointers, Strings, Structures, Unions and Input and Output using Files.


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DEPARTMENT OF COMPUTER SCIENCE
PROGRAM NAME: BCA
COURSE NAME: INTRODUCTION TO WEB TECHNOLOGY
(w.e.f 2023-24)

PAPER CODE: BCA144
YEAR/SEMESTER: I/I

PPW: 4
NO. OF CREDITS: 4

COURSE OBJECTIVE: To provide students with a comprehensive understanding of web technology concepts as HTML, CSS, JavaScript, RWD and TypeScript. This equips them with the skills to develop web-based applications to handle real-world problems.

UNIT-WISE COURSE OBJECTIVES:

COb1: To discuss the basic concepts like Internet, WWW, web browser, web servers, URL, HTTP and HTML5.

COb2: To explain the usage of Cascading Style Sheets to develop dynamic style pages.

COb3: To discuss the importance of Responsive Web Design (RWD) and explore various views.

COb4: To discuss the concepts of JavaScript and event handlers.

COb5: To discuss the basic concepts of TypeScript, interface function and modules.

UNIT-I

Introduction: World Wide Web, Web-Browsers, Web-Servers, BOM, DOM, HTTP.

HTML5: Introduction, HTML5 Tags, Links, Input, Images, Lists, Tables, Creating Forms, Styling Forms. Id vs Class elements.

(Book 1: Chapters - 1, 2, 3)

UNIT-II

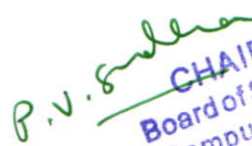
CSS3- Basics: Need and Benefit of CSS3, CSS3 Syntax, Comments, Including CSS3 in HTML Documents, Levels of Style Sheet (Inline, Embedded and External Style Sheets).

CSS3- Selectors: Universal Selector, Element Type Selector, Id Selectors, Class Selectors, Group Selectors.

CSS3-Styles: CSS Color, CSS Background, CSS Fonts, CSS Text, CSS Links, CSS Lists, CSS Tables. CSS3-Box Model: Margin, Padding, Border, Outline, Visibility, Display, Multiple Columns.

(Book 1 – Chapter - 3)


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UNIT-III

Responsive Web Design (RWD): Introduction, Viewport, Creating Responsive Websites, Responsive Images, Responsive Texts.

RWD-Media Queries: Introduction, Media Types, Device Breakpoints.

RWD-Grid View: Introduction, Grid-Row, Grid-Column.

(Book 2 – Chapters – 1, 2, 3, 4)

UNIT-IV

Introduction to JavaScript, JavaScript and Forms, Variables, Functions, Operators, Conditional Statements and Loops, Arrays, DOM Methods, Strings, JavaScript Closures (Local and Global Variable) , JSON. Events Handling (Mouse Events, Keyboard Events).

(Book 1 – Chapters - 4, 5)

UNIT-V: XML

Introduction to TypeScript-Overview of Typescript, Interface, classes, Functions, Generics, Enums, Adv Types, Modules, JSX Overview.

(Book 3 – Chapters - 1, 3, 4, 13)

Suggested Reading:

1. Robert W. Sebesta, Programming the World Wide Web, 3rd Edition, Pearson Education, 2013.
2. Responsive Web Design Ethan Marcotte Foreword by Jeremy Keith.
3. Yakov Fain, Anton Moiseev, TypeScript Quickly, 1st Edition, Manning Publications, 2020.
4. Wendy Willard, HTML5, McGraw Hill Education (India) Edition, 2013.
5. R. Nageswara Rao, Core Python Programming, 1st Edition, Dreamtech Press, 2001
6. John Pollock, JavaScript, 4th Edition, McGraw Hill Education (India) Edition, 2013.
7. Internet & World Wide Web-HOW TO PROGRAM-5th Edition, Deitel. Published by Pearson, 2021

COURSE OUTCOMES:

At the end of the course students will be able to:

BCA144 CO1: Develop simple programs using HTML5.

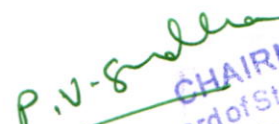
BCA144 CO2: Implement different types of Cascading Style Sheets and develop simple JavaScript programs.

BCA144 CO3: Apply the concepts of Responsive Web Design concept and controls.

BCA144 CO4: Develop applications using JavaScript with Event Handlers.

BCA144 CO5: Apply the concepts of TypeScript, function and Modules.


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DEPARTMENT OF COMPUTER SCIENCE
PROGRAM NAME: BCA
COURSE NAME: WEB TECHNOLOGY LAB
(w.e.f 2023-24)

PAPER CODE: BCA144P

YEAR/SEMESTER: I/I

COURSE OBJECTIVE: Enable Students to develop Web Applications.

COB1: To impart knowledge on the usage of HTML, JavaScript and Graphics.

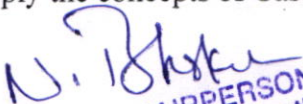
COB2: To demonstrate concepts of Cascading Style Sheets, Event Handling and TypeScript.

1. Visual Studio Code Installation, TypeScript Extension Installation in Visual Studio Code.
2. Create a Webpage Layout using Semantic elements.
3. Add Audio and Video element to a Webpage.
4. Drawing 2D Graphics using Canvas.
5. Program to find current location using Geolocation.
6. Demonstrate Placeholder, Inline and Block elements.
7. Styling Text and Fonts using CSS3 properties.
8. Styling Lists and Links using CSS3 properties.
9. Styling Tables using CSS3 properties.
10. Styling Webpage Backgrounds using CSS3 properties.
11. Demonstrate Form Validation.
12. Demonstrate DOM Methods.
13. Demonstrate HTML Events.
14. Write TypeScript code to perform Arithmetic Operations.
15. Demonstrate Functions in TypeScript.


COURSE OUTCOMES: At the end of the course students will be able to:

BCA144P CO1: Develop simple programs using HTML, Javascript and Graphics.

BCA144P CO2: Apply the concepts of Cascading Style Sheets, Event Handling and TypeScript.


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DEPARTMENT OF COMPUTER SCIENCE
PROGRAM NAME: BCA
COURSE NAME: EFFECTIVE COMMUNICATION
(w.e.f 2023-24)

PAPER CODE: BCA145
YEAR/SEMESTER: I/I

PPW: 4
NO. OF CREDITS: 4

COURSE OBJECTIVE: To impart skills for effective communication for personal and professional enhancement.

UNIT-WISE COURSE OBJECTIVES:

COB1: To promote effective communication by making students aware of the role and importance of communication; the features, process and types of communication; and the barriers to communication.

COB2: To develop awareness of personality and interpersonal communication.

COB3: To study the appropriate usage of English language.

COB4: To build vocabulary and written communication skills.

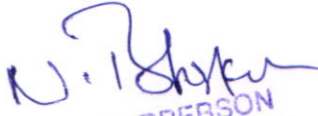
COB5: To comprehend unseen passages.

UNIT-I


Effective Communication: Role and importance of communication; Features of human communication; Process of communication; Barriers to communication; Oral and Written Communication; Importance of listening, speaking, reading, and writing; Types of communication: Verbal – formal versus informal communication, one-way versus two-way communication, Non-verbal communication.

UNIT-II

Personality Development and Interpersonal Communication: Models of interpersonal development, Johari window, Knapp's model, Styles of communication, Time management, Emotional Quotient, Teamwork, Persuasion techniques.


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UNIT-III

Remedial English: Tenses, Subject-verb agreement, Noun-pronoun agreement, Misplaced modifiers, Articles, Prepositions, Redundancies, Clichés. (Note: The focus is on appropriate usage)

UNIT-IV

Vocabulary Building and Written Communication: Roots and affixes; Words often confused: Homonyms, Homophones, Homographs; One-word substitutes; Idiomatic usage: Idioms, Phrases, Phrasal Verbs; Synonyms; Antonyms; Paragraph writing; Précis writing; Essay writing; Official letters; E-mail etiquette; Technical report writing: Feasibility and Progress reports.

UNIT-V

Reading Comprehension: Unseen Passages, A.P.J. Abdul Kalam, Azim Premji, Sachin Tendulkar, Sathya Nadella, Sam Pitroda (Note: No descriptive questions to be set from this unit and only Reading Comprehension/s from unseen passages should be set in the Examination Question Papers)

Suggested Reading:

1. E. Suresh Kumar, Engineering English, Orient BlackSwan, 2014
2. Language and Life A Skills Approach, Orient Black Swan, 2018
3. Michael Swan, Practical English Usage. OUP, 1995
4. Ashraf Rizvi, M, Effective Technical Communication, Tata McGraw Hill, 2009.
5. Meenakshi Raman and Sangeeta Sharma. Technical Communication: Principles and Practice. OUP, 2011.

COURSE OUTCOMES:

At the end of the course students will be able to:

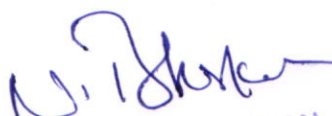
BCA145 CO1: Value and demonstrate effective communication.

BCA145 CO2: Develop enhanced interpersonal communication through understanding of personality and relational development


BCA145 CO3: Demonstrate appropriate usage of English language.

BCA145 CO4: Apply appropriate vocabulary and to compose paragraphs, precis, essays, official letters and technical reports.

BCA145 CO5: Understand and analyse the content of unseen passages.


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DEPARTMENT OF COMPUTER SCIENCE
PROGRAM NAME: BCA
COURSE NAME: IT WORKSHOP
(w.e.f 2023-24)

PAPER CODE: BCA146P

YEAR/SEMESTER: I/I

COURSE OBJECTIVE: Impart knowledge in students about IT Hardware, Open Office and Networking.

CO1: To illustrate about System Peripherals, Operating System Installation, vi editor and Open Office.

CO2: To demonstrate network configuration & software installation, internet & world wide web and troubleshooting.

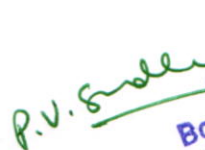
- 1. IT Hardware:** Identification of Parts / Peripherals and System Assembling , Disassembling
- 2. Operating System Installation** – Install Operating Systems like Windows, Linux along with necessary Device Drivers.
- 3. Introducing to Programming Environment** (Linux commands, editing tools such as vi editor, sample program entry, compilation and execution)
- 4. MS-Office / Open Office**
 - a. Word – Formatting Page Borders, Reviewing Equations, symbols
 - b. Spread Sheet – organize data, usage of formula graphs charts
 - c. Power point – features of power point, guidelines for preparing an effective presentation
 - d. Access – creation of database, validate data
- 5. Network Configuration & Software Installation:** Configuring TCP/IP, proxy and firewall settings. Installing application software & tools.
- 6. Internet and World Wide Web-**Search Engines, Types of search engines, netiquette, Cyber hygiene.
- 7. Trouble Shooting** – Hardware trouble shooting, Software trouble shooting.

Suggested Reading:

1. K. L. James, Computer Hardware, Installation, Interfacing Troubleshooting and Maintenance, Eastern Economy Edition.
2. Gary B.Shelly, Misty E Vermaat and Thomas J. Cashman, Microsoft Office 2007 Introduction Concepts and Techniques, Windows XP Edition, 2007, Paperback.
3. Leslie Lam port, LATEX-User's Guide and Reference manual, Pearson, LPE, 2nd Edition.
4. Rudraprathap, Getting Started with MATLAB: A Quick Introduction for Scientists and Engineers, Oxford University Press, 2002.
5. Scott Mueller's, Upgrading and Repairing PCs, 18th Edition, Scott. Mueller, QUE, Pearson, 2008.


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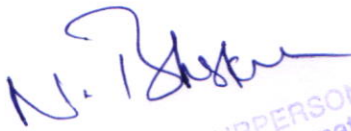

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6. Cherry I A Schmidt, The Complete Computer Upgrade and Repair Book, 3rd Edition , Dream tech.
7. Vikas Gupta, Comdex Information Technology Course Tool Kit , WILEY Dream tech.
8. ITL Education Solutions Limited, Introduction to Information Technology, Pearson Education.

COURSE OUTCOMES: At the end of the course students will be able to:

BCAI46P CO1: Identify System Peripherals, Install Operating System, work with vi editor and Open Office.

BCAI46P CO2: Apply network configuration & software installation, internet & world wide web and troubleshooting.


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DEPARTMENT OF COMPUTER SCIENCE
PROGRAM NAME: BCA
COURSE NAME: FUNDAMENTALS OF PROBABILITY AND STATISTICS
(w.e.f 2023-24)

PAPER CODE: BCA241
YEAR/SEMESTER: I/II

PPW: 4
NO. OF CREDITS: 4

COURSE OBJECTIVE: Students will gain the knowledge in basic statistics and learn to apply for real life data analysis. They will also acquire the knowledge to give the proper inference about the data.

UNIT-WISE COURSE OBJECTIVES:

COb1: To perceive the basic concepts in Statistics.

COb2: Calculate and interpret the various descriptive measures of centrality and dispersion.

COb3: Basic concepts of probability theory and apply concepts of various discrete and continuous probability distributions to various problems.

COb4: To explain the concepts of Random variable and Probability Distributions.

COb5: The concept of association between two variables and forecast future values by regression equations.

UNIT-I

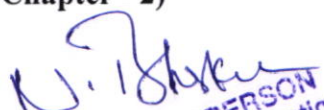
Introduction: Importance of Statistics, Concepts of Statistics, Population and a Sample; Quantitative and Qualitative Data; Collection of Primary and Secondary Data; Classification and Tabulation of Data. Construction of Univariate and Bivariate Frequency Distribution; Diagrammatic and Graphical Representation of Data.

(Book 1 – Chapters - 1, 2, 14)

UNIT-II

Descriptive Statistics: Measures of Central Tendency: Arithmetic Mean, Median, Mode, Geometric Mean, Harmonic Mean; **Measures of Dispersion:** Range, Quartile Deviation, Mean Deviation, Standard Deviation. Definition of Moments; **Measures of Skewness:** Karl Pearson's Coefficient of Skewness, Bowley's Coefficient of Skewness; Kurtosis.

(Book 1 – Chapter - 2)


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UNIT-III

Probability: Basic Terminology, Mathematical Probability, Statistical Probability, Axiomatic Approach to Probability, Theorems on Probability.

Conditional Probability, Multiplication Theorem of Probability, Independent Events, Pairwise/Mutually Independent Events, Bayes' Theorem.

(Book 1 – Chapters - 3, 4)

UNIT-IV

Random variable: Definition of a Random Variable, Discrete and Continuous Random Variables, Functions of Random Variables, Probability Mass Function, Probability Density Function, Mathematical Expectation of a Random Variable, and Properties of Expectation.

Probability Distributions: Binomial, Poisson and Normal Distribution.

(Book 1 – Chapters - 5, 6, 8, 9)

UNIT-V

Correlation and Regression Analysis: Definition of Correlation, Scatter Diagram, Karl Pearson's Coefficient of Correlation; Partial and Multiple Correlation Coefficients (for three variables); Definition of Regression, Simple Linear Regression (for 2 variables).

Small Sample Tests: Basic Definitions of Testing of Hypothesis; **t-Test:** t-test for Single Mean, t-test for Difference of Means, Paired t-test. **F-Test:** F-test for Equality of Two Population Variances.

CHI-SQUARE Test: Test for Single Variance (Population Variance) and Test of Independence of Attributes.

(Book 1 – Chapters – 10, 11, 12, 15, 16)

Suggested Reading:

1. S.C. Gupta and V.K. Kapoor, "Fundamentals of Mathematical Statistics", Sultan Chand & Sons, 12th Edition, 2020.
2. A.M. Gun, M.K. Gupta, B.Dasgupta, "Fundamentals of Statistics", Vol-1, the world press Pvt. Ltd., Kolakota.
3. William Mendenhall, Robert J. Beaver, Barbara M. Beaver, "Introduction to Probability and Statistics", Thomson Brooks / Cole, Eleventh Edition, 2003.
4. Richard A. Johnson, "Probability and Statistics for Engineers", Prentice Hall of India, Seventh Edition, 2005.

COURSE OUTCOMES: At the end of the course students will be able to:

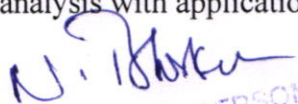
BCA241 CO1: Develop skills in presenting quantitative and qualitative data using appropriate diagrams, tabulations and construction of frequency distributions.

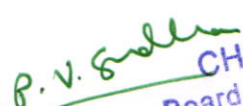
BCA241 CO2: Acquire knowledge of various types of data, their organisation and evaluation of summary measures such as measures of central tendency and dispersion.

BCA241 CO3: Calculate probabilities by applying probability laws and theoretical results, knowledge of important discrete and continuous distributions, their interrelations with real time applications.

BCA241 CO4: Acquire knowledge on random variable and probability distributions.

BCA241 CO5: Compute and interpret Correlation Analysis, regression lines and multiple regression analysis with applications.


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DEPARTMENT OF COMPUTER SCIENCE
PROGRAM NAME: BCA
COURSE NAME: OBJECT ORIENTED PROGRAMMING USING CPP
(w.e.f 2023-24)

PAPER CODE: BCA242
YEAR/SEMESTER: I/II

PPW: 4
NO. OF CREDITS: 4

COURSE OBJECTIVE: To enable students with the concepts of object oriented programming and develop simple applications.

UNIT-WISE COURSE OBJECTIVES:

COB1: To discuss the benefits and applications of object oriented approach, explain the concepts like Constants, variables, Data types, Operators, Control looping statements.

COB2: To illustrate different control branching statements with real-time examples and explain about Functions.

COB3: To explain the usage of member functions and constructors.

COB4: To construct class programs with inheritance, pointers.

COB5: To explore the concepts of polymorphism, templates and exception handling.

UNIT-I

Introduction to OOP: Procedure Oriented Programming, Object-oriented programming, Basic concepts of OOP, Benefits and Applications of OOP, Simple C++ program, structure of C++ program, creating compiling and linking a file.

Tokens: Keywords, Identifiers, Constants, Basic data types, User defined data types, Operators in C++.

Control Structures & Branching: if, if-else, elseif ladder, nested if, switch.

(Book 1 - Chapters - 1, 2, 3)

UNIT-II

Control structures and looping: for, While, do while, break, continue, exit, goto.

Classes and Objects: Specifying a Class, Defining Member Functions, C++ program with Class, Private Member Functions, Arrays within Class, Memory Allocation for Objects, Static Data Members, Static Member Functions, Arrays of Objects, Returning Objects.

(Book 1- Chapters - 3, 5)

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UNIT-III

Functions in C++: Main Function, Function Prototyping, Call by Reference, Return By Reference, Scope Resolution Operator, Inline Functions, Default Arguments, Function Overloading, Friend Function.

Constructors and Destructors: Constructors, Parameterized Constructors, Multiple Constructors in a Class, Copy Constructors, Destructors.

(Book 1- Chapter - 4)

UNIT-IV

Inheritance: Introduction to Inheritance, Single Inheritance, Multi Level Inheritance, Multiple Inheritance, Hierarchical Inheritance, Hybrid Inheritance.

Operator Overloading: Rules for Operator Overloading, Overloading Unary Operators, Overloading Binary Operators.

Pointers: Introduction to Pointers, Declaring and Initializing Pointers, Arithmetic Operators on Pointers, Member Dereferencing Operators, 'this' Pointer.

(Book 1- Chapters – 8, 7, 9, 3)

UNIT-V

Polymorphism and Virtual Functions: Compile Time Polymorphism Vs Runtime Polymorphism, Virtual Functions.

Templates: Introduction, Function Templates, Class Templates.

Exception Handling: Introduction, Exception Handling Mechanism, Throwing Mechanism, Catch Mechanism.

(Book 1- Chapters - 9, 12, 13)

Suggested Reading:

1. E. Balagurusamy, Object Oriented Programming with C++, 8th Edition, McGraw Hill, 2020.
2. Behrouz A. Forouzan and Richard F. Gilberg, Computer Science: A Structured Approach Using C++, 3/e, Cengage Learning India Private Limited, 2012.
3. Ashok N. Kamthane, Object Oriented Programming with ANSI and Turbo C++, 1/e, Pearson Education, 2006.

COURSE OUTCOMES:

At the end of the course students will be able to:

BCA242 CO1: Develop simple programs.

BCA242 CO2: Implement different control statements.

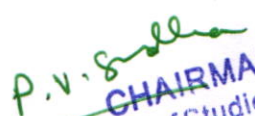
BCA242 CO3: Program the concepts of classes and member functions.

BCA242 CO4: Apply the concepts of Inheritance

BCA242 CO5: Implement polymorphism, templates and exception handling


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DEPARTMENT OF COMPUTER SCIENCE
PROGRAM NAME: BCA
COURSE NAME: OBJECT ORIENTED PROGRAMMING USING CPP LAB
(w.e.f 2023-2024)

PAPER CODE: BCA242P


YEAR/SEMESTER: I/II

COURSE OBJECTIVE: To enable students with the concepts of object oriented programming and develop simple applications using classes and objects.

COB1: To demonstrate functions, arrays, pointers, classes and constructors.

COB2: To illustrate inheritance, templates and exception handling.

1. Write a program to demonstrate if, for, while.
2. Write a program to demonstrate switch case.
3. Write a program that contains a function to exchange (swap) values of two arguments by using pointers and References parameters
4. Write a program to check the given string is palindrome or not
5. Write a program to find transpose of a given matrix of m into n size
6. Write a program to add corresponding elements of a given matrix of 2D matrix.
7. Demonstrate the concept of classes and objects.
8. Write a program to demonstrate inline functions.
9. Demonstrate friend function with two classes.
10. Write a Program to generate Fibonacci Series by using Constructor to initialize the Data Members
11. Write a program to find the area of different geometric shapes (circle rectangle and cube) using function overloading
12. Write a program to demonstrate
 - a. Default constructor
 - b. Copy constructor
 - c. Parameterized constructor
 - d. Destructor
13. Demonstrate the use of 'this' operator
14. Write a program to use arithmetic operators on the pointer variable declared.


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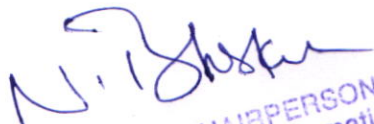

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15. Write a program to demonstrate single inheritance, hybrid inheritance.
16. Write a program to demonstrate multi level inheritance and multiple inheritances.
17. Demonstrate unary and binary operator overloading.
18. Write a program to demonstrate virtual functions.
19. Write a program to demonstrate class template and function template
20. Write a program to demonstrate exception handling.

COURSE OUTCOMES: At the end of the course students will be able to:

BCA242P CO1: Implement arrays, pointers, classes and constructors.

BCA242P CO2: Develop applications using inheritance, templates and exception handling.


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DEPARTMENT OF COMPUTER SCIENCE
PROGRAM NAME: BCA
COURSE NAME: COMPUTER ARCHITECTURE
(w.e.f 2023-24)

PAPER CODE: BCA243
YEAR/SEMESTER: I/II

PPW: 4
NO. OF CREDITS: 4

COURSE OBJECTIVE: This course will expose students to the basic architecture of processing, memory and I/O organization in a computer system

UNIT-WISE COURSE OBJECTIVES:

- COB1:** To discuss the basic concepts of functional units, bus structures, software performance, memory locations, addressing modes & basic I/O operations
- COB2:** To illustrate different arithmetic operations like addition, subtractions, multiplication, integer division and operations.
- COB3:** To explain the fundamental concepts of processing unit, hardwired, micro programmed control, pipeline and data path control consideration.
- COB4:** To explain about memory systems ROM, RAM, speed, size and cost, cache memory, virtual memory and secondary storage.
- COB5:** To explain about I/O Devices, interrupts, DMA, BUSES, I/O interface and standard circuits.

UNIT-I

Basic Structure of Computers:

Functional units, Basic operational concepts, Bus structures, Software, Performance.

Machine Instructions and Programs:

Memory locations and addresses, Memory operations, Instruction and Instruction Sequencing, Addressing Modes, Assembly Language, Basic I/O Operations.

(Book 1 – Chapters – 1, 2)

UNIT-II

Arithmetic Unit:

Addition and Subtraction of Signed Numbers, Design of Fast Adders, Multiplication of Positive Numbers, Signed Operand Multiplication and Fast multiplication, Integer Division.

(Book 1 – Chapter – 6)

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UNIT-III

Basic Processing Unit:

Fundamental Concepts, Execution of a Complete Instruction, Hardwired Control, and Microprogrammed control.

Pipelining:

Pipelining, Basic Concepts, Data Hazards, Instruction Hazards, Influence on Instruction Sets, Data Path and Control Consideration.

(Book 1 – Chapters – 7, 8)

UNIT-IV

Memory System:

Basic Concepts, Semiconductor RAMs, ROMs, Speed, Size and Cost, Cache Memories, Performance Consideration, Virtual Memory, Memory Management Requirements, Secondary Storage.

(Book 1 – Chapter - 5)

UNIT-V

Accessing I/O Devices, Interrupts-Interrupt Hardware, Enabling and Disabling, Handling Multiple Devices, Controlling Device Requests, Direct Memory Access-Bus Arbitration, Buses –Synchronous, Asynchronous, Interface Circuits-Parallel Port, Serial Port, Standard I/O Interfaces (PCI, SCSI, USB).

(Book 1 – Chapter - 4)

Suggested Reading:

1. Carl Hamacher, Zvonko Vranesic and Safwat Zaky, 5th Edition “Computer Organization”, McGraw-Hill, 2011.
2. William Stallings, “Computer Organization and Architecture – Designing for Performance”, 6th Edition, Pearson Education, 2003.
3. David A.Patterson and John L.Hennessy, “Computer Organization and Design: The hardware / software interface”, 2nd Edition, Morgan Kaufmann, 2002.
4. John P.Hayes, “Computer Architecture and Organization”, 3rd Edition, McGraw Hill, 1998.

COURSE OUTCOMES:

At the end of the course students will be able to:

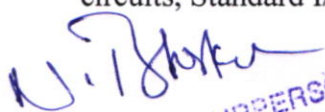
BCA243 CO1: Acquire knowledge on concepts such as functional units, bus structures, software performance, memory locations, addressing modes & basic I/O operations

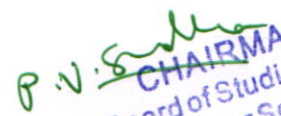
BCA243 CO2: Perform different arithmetic operations, integer division and operations.

BCA243 CO3: Acquire knowledge of fundamental concepts, hardwired, micro programmed control, pipeline and data path control consideration.

BCA243 CO4: Understood About memory systems, cache memory, virtual memory and secondary storage

BCA243 CO5: Acquire knowledge on I/O Devices, Interrupts, Direct Memory Access, Buses, Interface circuits, Standard I/O Interfaces (PCI, SCSI, USB).


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DEPARTMENT OF COMPUTER SCIENCE
PROGRAM NAME: BCA
COURSE NAME: DATA STRUCTURES
(w.e.f 2023-2024)

PAPER CODE: BCA244
YEAR/SEMESTER: I/II

PPW: 4
NO. OF CREDITS: 4

COURSE OBJECTIVE: To train the students with the concepts of Arrays, Stacks, Queues, Linked Lists, Hashing, Trees, Graphs, Sorting and Searching techniques.

UNIT-WISE COURSE OBJECTIVES:

COB1: To explain the Array as an abstract data type and String Pattern Matching.

COB2: To acquire knowledge on Stacks and Queues.

COB3: To learn Singly Linked list, Doubly Linked List, Circular List and Hashing.

COB4: To enlighten the importance of Trees and Graphs.

COB5: To determine the best Sorting and Searching techniques.

UNIT-I

Introduction to Data Structures: Definition, Uses, Types.

Arrays: Abstract Data Types and the C++ Class, Array as an Abstract Data Type, Representation of Arrays, Matrices, Strings—String Pattern Matching (A Simple Algorithm).

(Book 1 – Chapter - 2)

UNIT-II

Stacks and Queues: The Stack Abstract Data type- Representation of Stacks, Operations on Stacks, The Queue Abstract Datatype- Representation of Queues, Operations on Queues, Types of Queues-Circular Queue, Operations on Circular Queue.

(Book 1 – Chapter - 3)

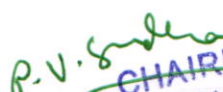
UNIT-III

Linked Lists: Singly Linked Lists-Defining a Node in C++,Insert and Delete operations on Singly Linked List, Doubly Linked Lists-Insert and Delete operations on Doubly Linked List, Circular Lists-Insert and Delete operations on Circular List.

Hashing: Static Hashing: Hash Tables, Hash Functions-Division, Mid-Square, Overflow Handling-Linear probing(Linear open addressing)

(Book 1- Chapters – 4, 8)


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UNIT-IV

Trees: Introduction, Binary Trees, Representation of Binary Tree, Binary Tree Traversal-Inorder, Preorder and Postorder Traversals, Binary Search Tree, Operations on Binary Search Tree- Searching, Insertion, Deletion operations on Binary Search Tree.

Graphs: Terminology, Types, Representation of Graph, Elementary Graph operations- DFS and BFS.
(Book 1 – Chapters – 5, 6)

UNIT-V

Sorting: Bubble Sort, Selection Sort, Insertion Sort, Quick Sort, Merge Sort-Merging, Heap Sort.

Searching Techniques: Linear Search, Binary Search.

(Book 1 – Chapters – 1, 7)

Suggested Reading:

1. Ellis Horowitz, Dinesh Mehta, S. Sahani. Fundamentals of Data Structures in C++, Universities Press, 2008.
2. Mark Allen Weiss, Data Structures and Algorithm Analysis in C++, Pearson Education 2006.
3. Michael T. Goodrich, Roberto Tamassia, David Mount, Data Structures and Algorithms in C++, Wiley India Pvt. Ltd, 2004.

COURSE OUTCOMES:

At the end of the course students will be able to:

BCA244 CO1: Summarize the concepts of Array as an abstract data type and String Pattern Matching.


BCA244 CO2: Review the various operations of Stacks and Queues.

BCA244 CO3: Govern the operations of Single Linked List, Doubly Linked List, Circular List and Hashing.

BCA244 CO4: Deliberate the logic of binary search tree operations and traversing a graph.

BCA244 CO5: Summarize the concepts of searching and sorting techniques.


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OF SCIENCE, HUMANITIES AND COMMERCE
(Reaccredited with 'A' Grade by NAAC)
Autonomous College – Affiliated to Osmania University

DEPARTMENT OF COMPUTER SCIENCE
PROGRAM NAME: BCA
COURSE NAME: DATA STRUCTURES LAB
(w.e.f 2023-2024)

PAPER CODE: BCA244P

YEAR/SEMESTER: I/II

COURSE OBJECTIVE: Enable students with the concepts of linear and non-linear data structures.

COB1: To illustrate the concepts of arrays, strings, stack, queues, linked lists.

COB2: To demonstrate trees, sorting and searching techniques.

1. Write a C++ program for the implementation of Array.
2. Write a C++ program to implement the operations of Sparse Matrices.
3. Write a C++ program for the implementation of String.
4. Write a C++ program to implement the following using array
 - a. Stack
 - b. Queue
5. Write a C++ program to implement the following using
 - a. Singly linkedlist
 - b. Doubly linkedlist
 - c. Circular linkedlist
6. Write a C++ program to implement stack using linkedlist.
7. Write a C++ program to implement queue using linkedlist.
8. Write a C++ program to implement Heap Tree.
9. Write a C++ program to implement binary tree.
10. Write C++ program for implementing the following sorting methods
 - a. Bubble sort
 - b. Selection sort
11. Write C++ program for implementing the following sorting methods
 - a. Insertion sort
 - b. Quick sort
12. Write C++ program for implementing the shell sorting method.
13. Write C++ program for implementing the following sorting methods
 - a. Merge sort
 - b. Heap sort
14. Programs on Linear Search and Binary Search.


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COURSE OUTCOMES: At the end of the course students will be able to:

BCA244P CO1: Implement arrays, strings, stack, queues, and linked lists.

BCA244P CO2: Apply the concepts of trees, sorting and searching techniques.

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DEPARTMENT OF COMPUTER SCIENCE
PROGRAM NAME: BCA
COURSE NAME: ADVANCED COMPUTER NETWORKS
(w.e.f 2023-2024)

PAPER CODE: BCA245
YEAR/SEMESTER: I/II

PPW: 4
NO. OF CREDITS: 4

COURSE OBJECTIVE: Enable students to acquire knowledge on protocols, operations of different layers and security methods.

UNIT-WISE COURSE OBJECTIVES:

COB1: To introduce network models, error detection techniques and flow control methods.

COB2: To comprehend switching and asynchronous transfer mode (ATM).

COB3: To explain IPv4, IPv6 addresses, congestion control and resource allocation.

COB4: To describe the concepts of congestion avoidance mechanisms, unicast routing protocols and multicast routing protocols.

COB5: To outline the concepts of optical networking, multimedia over internet, domain name system and security.

UNIT-I

Network Architecture: Layering and Protocols (7 layer model), Internet Architecture (TCP/IP).

Performance: Bandwidth and Latency, High Speed Networks. **Error Detection:** Two-Dimensional Parity, Internet Checksum Algorithm, Cyclic Redundancy Check. **Reliable Transmission:** Stop-and-Wait, Sliding Window, **Ethernet and Multiple Access Networks** (802.3), **Overlay Networks:** Routing Overlays, Peer-to-Peer Networks and Content Distribution Networks.

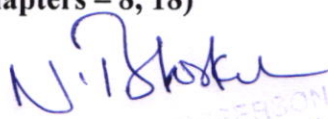
(Book 1 – Chapters – 1, 2, 9)


UNIT-II

Switching: Circuit-Switched Networks, Datagram Networks, Virtual-Circuit Networks, Message Switched Networks.

Asynchronous Transfer Mode (ATM): Design Goals, Problems, Architecture, Switching, ATM Layers, ATM LANs.

(Book 2 – Chapters – 8, 18)


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UNIT-III

IPv4: Address Space, Notations, Classful, Classless, Network Address Translation, Datagram, Fragmentation and Checksum.

IPv6 Addresses: Structure, Address Space, Advantages, Packet Format and Extension Headers. ARP, RARP, ICMP, IGMP.

Congestion Control and Resource Allocation: Problem, Issues in Resource Allocation, Queuing Disciplines, TCP Congestion Control.

(Book 2 – Chapters – 19, 20, 21, Book 1 – Chapter – 6)

UNIT-IV

Congestion Avoidance Mechanisms: DEC bit, Random Early Detection (RED) and Source-Based Congestion Avoidance.

Quality of Service: Application Requirements, Integration Services (RSVP) Differentiated Services (EF, AF), Equation-Based Congestion Control.

Unicast Routing Protocols: Intra-Domain and Inter-Domain Routings, RIP, OSPF.

Multicast Routing Protocols: DVMRP, PIM-DM, PIM-SM, CBT, MSDP and MOSPF.

(Book 1 – Chapter – 6, Book 2 – Chapter – 22)

UNIT-V

Sonet/SDH: Architecture, SONET Layers, SONET Frames, STS Multiplexing, SONET Networks and Virtual Tributaries.


Domain Name System: NameSpace, Domain Name Space, Distribution, DNS in Internet Resolution and Dynamic Domain Name System, SNMP

Security in the Internet: IPSec, SSL/TLS, PGP and Firewalls.

(Book 2 – Chapters – 17, 25, 28, 32)

Suggested Reading:

1. Larry L. Peterson and Bruce S. Davie, "Computer Networks: A System Approach", Fifth Edition, Morgan Kaufmann, Elsevier, 2012.
2. Behrouz A. Forouzan, Data Communications and Networking, McGrawHill, Fifth Edition, 2017.
3. Chwan-Hwa (John) Wu, J. David Irwin, Introduction to Computer Networks and Cyber Security, CRC Press, Taylor & Francis Group, 2014
4. Andrew S. Tanenbaum, David J. Wetherall, Computer Networks, Pearson, 5th Edition, 2014.
5. G. Wright and W. Stevens, TCP/IP Illustrated, Volume 1 and Volume 2, Addison-Wesley, 1996.
6. Dayanand Ambawade, Deven Shah, Mahendra Mehra and Mayank Agarwal, Advanced Computer Network, Dreamtech Press, 2016.
7. R. Srikant, The Mathematics of Internet Congestion Control, Springer, 2004. J.L. Boudec and P. Thiran, Network Calculus, Springer, 2011.


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COURSE OUTCOMES: At the end of the course students will be able to:

BCA245 CO1: Acquire knowledge on network models, error detection techniques and flow control methods.


BCA245 CO2: Interpret how different types of switching techniques and ATM is handled for data communication.

BCA245 CO3: Compare IPV4 and IPV6 address space, congestion control and resource allocation.

BCA245 CO4: Determine different routing protocols used for unicast and multicast traffic and congestion avoidance.

BCA245 CO5: Acquire knowledge on SONET/SDH, DNS and security protocols.


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DEPARTMENT OF COMPUTER SCIENCE
PROGRAM NAME: BCA
COURSE NAME: COMMUNICATION SKILLS LAB
(w.e.f 2023-2024)

PAPER CODE: BCA246P

YEAR/SEMESTER: I/II

COURSE OBJECTIVE: To expose students to the nuances of English language and to enhance their communication skills.

COB1: To expose students to an English-speaking environment and to enhance their listening comprehension.


COB2: To enable students improve their pronunciation and to develop their spontaneity, creativity and fluency in using English language orally'

1. Introduction to English Phonetics: Organs of Speech: respiratory, articulatory and phonatory systems; Sounds of English: Introduction to International Phonetic Alphabet; Minimal pairs; Syllable; Word Stress; Introduction of rhythm and intonation; Difficulties of Indians speakers with stress and intonation.
2. Speaking Activities: Self Introduction, Picture perception, JAM.
3. Group discussion, Debate, Presentation skills.
4. Listening Activities: Listening to different types of materials for effective comprehension.
5. Role play: Use of dialogues in a variety of situations and settings

Suggested Reading:

1. E. Suresh Kumar. A Handbook for English Language Laboratories (with CD). Revised edition, Cambridge University Press India Pvt. Ltd. 2014
2. T. Balasubramanian. A Textbook of English Phonetics for Indian Students. Macmillan, 2008.
3. J. Sethi et al., A Practical Course in English Pronunciation (with CD). Prentice Hall of India, 2005.
4. Hari Mohan Prasad. How to Prepare for Group Discussions and Interviews. Tata McGraw Hill, 2006.


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COURSE OUTCOMES: At the end of the course students will be able to:

BCA246P CO1: Demonstrate the ability to comprehend, draw inferences and analyse the oral information presented in English, in various contexts.

BCA246P CO2: Demonstrate confidence in using English language effectively to communicate their ideas orally, in diverse situations.

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