SYLLABUS

OF

BACHELOR OF

COMPUTER

APPLICATIONS

IYEAR

(U.G)

CBCS

(2024-25)

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. 2024-2025

Scheme of Instruction and Examination

Sl.No.	SEMESTER – I										
	Code	Paper Title	Course Type	PPW		Max. Marks		Max. Marks		Credits	
				TH	PR	TH	TH- CIA	PR	PR - CI A		
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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2

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. 2024-2025

Scheme of Instruction and Examination

Sl.No.	SEMESTER – II											
	Code	Paper Title	Course Type	PPW		Max. Marks		Max. Marks		Credits		
				TH	PR	TH	TH- CIA	PR	PR - CI A			
1	BCA241	Applied Mathematics	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 using C	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 using C 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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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: MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE (w.e.f 2024-25)

PAPER CODE: BCA141

PPW: 4

YEAR/SEMESTER: I/I

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)

4

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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:

- 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.
- 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.

5

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DEPARTMENT OF COMPUTER SCIENCE PROGRAM NAME: BCA COURSE NAME: DIGITAL PRINCIPLES (w.e.f 2024-25)

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)

6

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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.

7

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DEPARTMENT OF COMPUTER SCIENCE PROGRAM NAME: BCA COURSE NAME: PROGRAMMING IN C

(w.e.f 2024-25)

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)

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, Accessingelements 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, Prientice -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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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: PROGRAMMING IN C LAB (w.e.f 2024-25)

PAPER CODE: BCA143P

YEAR/SEMESTER: I/I

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

CObl: 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 $1 + 1/x + 1/x^2 + 1/x^3 + ... + 1/x^n$.
- 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.

10

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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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11

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DEPARTMENT OF COMPUTER SCIENCE PROGRAM NAME: BCA COURSE NAME: INTRODUCTION TO WEB TECHNOLOGY (w.e.f 2024-25)

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, Style Sheet (Inline, Embedded and External Style 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, Generices, 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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13



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DEPARTMENT OF COMPUTER SCIENCE PROGRAM NAME: BCA COURSE NAME: WEB TECHNOLOGY LAB

(w.e.f 2024-25)

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

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

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

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

14

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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: EFFECTIVE COMMUNICATION

(w.e.f 2024-25)

PAPER CODE: BCA145

PPW: 4

YEAR/SEMESTER: I/I

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, Johani 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: Passages on Indian Knowledge Systems - Educating Sciences of Life and Mind: Nature and Consciousness, Modern medicine and Indian wisdom: Mind and disease, Ayurveda as a knowledge system: Changing perceptions on the nature of Ayurveda, Social organization of knowledge in India - Folk and Classical Traditions: Creativity at the Grass Roots, Agriculture and Trade in India: Agriculture, Vision of Disaster Management in Kautilya's Arthasastra: Managing Flood and Managing Epidemic (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.
- 6. Kapil Kapoor and Awadhesh Kumar Singh, Indian Knowledge Systems: Vol. 1, Indian Institute of Advanced Study, Shimla and DK Printworld (P) Ltd. 2005

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.

16

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DEPARTMENT OF COMPUTER SCIENCE PROGRAM NAME: BCA COURSE NAME: IT WORKSHOP (w.e.f 2024-25)

PAPER CODE: BCA146P

YEAR/SEMESTER: I/I

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

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

COb2: 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.

17

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- 6. Cherry l 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:

BCAl46P CO1: Identify System Peripherals, Install Operating System, work with vi editor and Open Office.

BCAl46P CO2: Apply network configuration & software installation, internet & world wide web and troubleshooting.

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18

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DEPARTMENT OF COMPUTER SCIENCE PROGRAM NAME: BCA COURSE NAME: APPLIED MATHEMATICS (w.e.f 2024-25)

PAPER CODE: BCA241 YEAR/SEMESTER: I/II

PPW: 4

NO. OF CREDITS: 4

COURSE OBJECTIVE: To familiarize concepts in basic notions of differential calculus and modern mathematical subjects.

UNIT-WISE COURSE OBJECTIVES:

COb1: Apply a range of techniques to solve first & second order partial differentials.

COb2: To construct mathematical expressions involving functions and their derivatives, compute mathematical quantities using differential calculus and to solve Arithmetic Progression using old Sanskrit Mathematical texts.

COb3: To learn concepts in Vector Space and Subspace.

COb4: To acquire knowledge about Row space, Column space, Null space and matrix of Linear Transformation.

COb5: To explain the concepts of Eigen Vectors and Eigen Values.

UNIT I

Partial Differentiation: Introduction - Functions of two variables - Neighborhood of a Point (a, b) Continuity of a Function of Two Variables, Continuity at a Point - Limit of a Function of Two Variables -Partial Derivatives - Geometrical Representation of a Function of Two Variables - Homogeneous Functions. (Book 1 - Chapter: 11(11.1 to 11.8))

UNIT II

Theorem on Total Differentials, Composite Functions, Differentiation of Composite Functions, Implicit Functions, Equality of $f_{xy}(a, b)$ and $f_{yz}(a, b)$, Taylor's Theorem for a Function of Two Variables, Arithmetic Progression on comparing its treatment in old Sanskrit Mathematical texts and modern secondary school curriculum in India.

(Book 1 - Chapters: 11(11.10, 11.11), Book 3-Chapter 15)

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UNIT III

Vector Spaces: Vector Spaces and Subspaces, Linearly Combinations, Linearly Independent and Dependent Sets; Bases, Coordinate Systems, The Dimension of a Vector Space.

(Book 2 - Chapters: 4.1, 4.3, 4.4 & 4.5)

UNIT IV

Null Space, Column Space and Row Space of a Matrix, Basis and Dimensions of Null Space, Column Space and Row Space of a Matrix, Rank and Rank Theorem, Linear Transformations, Kernel and Range of Linear Transformations, Matrix of a Linear Transformations. (Book 2 - Chapter: 4.2, 4.6, & 4.7)

UNIT - V

Eigen Values, Eigen Vectors, The characteristic Equation, Diagonalization, Complex Eigen

(Book 2 - Chapter: 5.1, 5.2, 5.3, 5.4, & 5.5)

NOTE: No proofs of theorems in all units.

Suggested Readings:

- 1. Shanti Narayan, P.K. Mittal Differential Calculus, 15th Edition, S.CHAND, NEW
- 2. David C Lay, Linear Algebra and its Applications 4th Edition, Pearson Publications.
- 3. Sita Sundar Ram, Ramakalyani V "History and Development of Mathematics in India", National Mission for Manuscripts.
- 4. S Lang, Introduction to Linear Algebra, Springer Publications, 2nd Edition.
- 5. Gilbert Strang, Linear Algebra and its Applications, Cengage Learning5th Edition
- 6. Shanti Narayan Integral Calculus, S.CHAND, NEW DELHI, 35th Edition

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

BCA241 CO1: Evaluate first & second order partial derivatives.

BCA241 CO2: Compute the Total Differentials, Composite Functions and evaluate Arithmetic Progression using old Sanskrit Mathematical texts.

BCA241 CO3: Interpret properties of Vector Space and Subspace.

BCA241 CO4: Compute and calculate Rank and Nullity.

BCA241 CO5: Evaluate eigen vectors and eigen values.

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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: OBJECT ORIENTED PROGRAMMING USING CPP (w.e.f 2024-25)

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.

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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)

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

22

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DEPARTMENT OF COMPUTER SCIENCE PROGRAM NAME: BCA COURSE NAME: OBJECT ORIENTED PROGRAMMING USING CPP LAB (w.e.f 2024-2025)

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.

CObl: 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.
- 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.

23

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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 2024-25)

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,
- 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 USING C (w.e.f 2024-25)

PAPER CODE: BCA244 YEAR/SEMESTER: I/II

PPW: 4

NO. OF CREDITS: 4

COURSE OBJECTIVE: To familiarize the students with concepts of Data Structures using C language.

UNIT-WISE COURSE OBJECTIVES:

COb1: To explain the concepts of Searching and Sorting.

COb2: To acquire knowledge of Stacks and Queues.

COb3: To be able to demonstrate the operations on Linked Lists.

COb4: To enlighten the importance of Trees.

COb5: To illustrate the concepts of Graphs.

UNIT-I

Introduction to Data Structures and Algorithms: Basic Terminology: Elementary Data Structure Organization, Classification of Data Structures, Operations on Data Structures.

Searching and Sorting: Introduction to Searching, Linear Search, Binary Search, Interpolation Search. Introduction to Sorting, Bubble Sort, Insertion Sort, Selection Sort, Merge Sort, Quick Sort.

(Book 1 - Chapters- 2, 14)

UNIT-II

Stacks: Introduction to Stacks, Array representation of Stacks, Operations on a Stack: Push, Pop, Peek operations, Applications of Stacks: Reversing a list, Conversion of an Infix expression into a Postfix expression, Recursion.

Queues: Introduction to Queues, Array representation of Queues, Types of Queues: Circular Queues, Priority Queues, Deques, Applications of Queues.

(Book 1 - Chapters - 7, 8)

UNIT-III

Linked Lists: Introduction, Basic Terminologies, Linked Lists versus Arrays, Singly Linked Lists: Traversing a Linked List, Searching for a value in a Linked List, Inserting a new node in a Linked List, Deleting a node from a Linked List.

Doubly Linked Lists: Inserting a new node in a Doubly Linked List, Deleting a Node from a Doubly Linked List.

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Circular Linked Lists: Inserting a new Node in a Circular Linked List, Deleting a Node from a Circular Linked List.

(Book 1- Chapter - 6)

UNIT-IV

Trees: Introduction-Basic Terminology, Types of Trees, Creating a Binary Tree from a General Tree, Traversing a Binary Tree: Pre-order, In-order, Post-order, Applications of Trees, Binary Search Trees, Operations on Binary Search Trees: Searching for a Node in a Binary Search Tree, Inserting a new node in a Binary Search Tree, Deleting a node from a Binary Search Tree.

(Book 1 - Chapters - 9, 10)

UNIT-V

Graphs: Introduction, Graph Terminology, Directed Graphs: Terminology of a Directed Graph, Representation of Graphs: Adjacency Matrix Representation, Adjacency List Representation, Graph Traversal Algorithms: Breadth-First Search algorithm, Depth-First Search algorithm, Minimum Spanning Tree, Dijkstra's Algorithm.

(Book 1 - Chapter - 13)

Suggested Reading:

- 1. Data Structures Using C, Reema Thareja, OXFORD University Press, Second Edition, 2014.
- 2. Data Structures using C, Aaron M. Tenenbaum, Yedidyah Langsam, Moshe J. Augenstein, Pearson, First Edition, 2019.
- 3. Data Structures using C, A.K. Sharma, Pearson India, Second Edition, 2013.
- 4. Data Structures Using C, Balaguruswamy, E, Tata McGraw-Hill Education India. Ist Edition, 2013.
- 5. Data Structures with C, Seymour Lipschutz, Schaum's Outline Series, Tata McGraw-Hill Education India, 2nd Edition, 2015.

COURSE OUTCOMES:

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

BCA244 CO1: Develop Searching and Sorting programs.

BCA244 CO2: Implement all the operations of Stacks and Queues.

BCA244 CO3: Implement Singly Linked Lists, Doubly Linked lists and Circular Linked Lists.

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BCA244 CO4: Implement all the operations of Trees.

BCA244 CO5: Implement all the traversals of Graphs.

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28



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DEPARTMENT OF COMPUTER SCIENCE PROGRAM NAME: BCA COURSE NAME: DATA STRUCTURES USING C LAB (w.e.f 2024-25)

PAPER CODE: BCA244P

YEAR/SEMESTER: I/II

COURSE OBJECTIVE: To enable students with the knowledge of Searching and Sorting techniques, Stacks, Queues and Binary Search Trees.

COb1: To implement C Programs for Searching and Sorting Techniques.

COb2: To implement C Programs for Linear Data structures and Binary Search Trees.

- 1. Program to demonstrate Linear Search.
- 2. Program to demonstrate Binary Search.
- 3. Program to demonstrate Interpolation Search.
- 4. Program to implement Bubble Sort.
- 5. Program to implement Selection Sort.
- 6. Program to implement Insertion Sort.
- 7. Program to implement Merge Sort.
- 8. Program to implement Quick Sort.
- 9. Program to implement PUSH and POP operations on Stack using array method.
- 10. Program to implement insert and delete operations on Queue using array method.
- 11. Program to implement insert and delete operations on Priority Queue.
- 12. Program to insert, delete and display operations on a Single Linked list.
- 13. Program to implement PUSH and POP operations on Stack using a Single Linked list.
- 14. Program to implement insert and delete operations on Queue using a Single Linked list.
- 15. Program to insert, delete and display operations on a Doubly Linked list.
- 16. Program to construct Binary Search Tree and implement Tree Traversing Techniques.
- 17. Program to insert a new node in a Binary Search Tree.
- 18. Program to delete a leaf node of a Binary Search Tree.
- 19. Program to search a node in a Binary Search Tree.
- 20. Program to create a Graph using Adjacency Matrix Representation.

29

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

BCA244P CO1: Implement Searching and Sorting Techniques using C.

BCA244P CO2: Implement Linear Data Structures and Non-Linear Data Structures using C.

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DEPARTMENT OF COMPUTER SCIENCE PROGRAM NAME: BCA COURSE NAME: ADVANCED COMPUTER NETWORKS (w.e.f 2024-25)

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 AccessNetworks (802.3), Overlay Networks: RoutingOverlays, 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. N. Photor

(Book 2 - Chapters - 8, 18)

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UNIT-III

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

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

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

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

UNIT-IV

CongestionAvoidanceMechanisms: 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 RoutingProtocols: 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 NameSystem: 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. LarryL. 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, IntroductiontoComputerNetworks andCyber Security, CRC Press, Taylor &Francis Group, 2014
- 4. AndrewS. Tanenbaum, David J. Wetherall, Computer Networks, Pearson, 5th Edition, 2014.
- 5. G. Wright and W. Stevens, TCP/IPIIlustrated, Volume 1 and Volume2, Addison-Wesley, 1996.
- 6. DayanandAmbawade, Deven Shah, Mahendra Mehra and MayankAgarwal, Advanced Computer Network, Dreamtech Press, 2016.
- 7. R.Srikant, The Mathematics of InternetCongestionControl, Springer, 2004.8. J.L. Boudec and P.Thiran, NetworkCalculus, 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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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: COMMUNICATION SKILLS LAB (w.e.f 2024-25)

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'

- 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:

- 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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