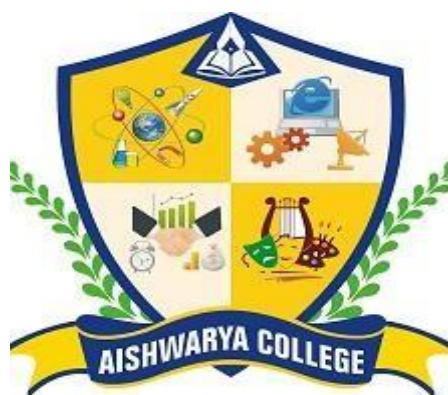# Department – Computer Science

Aishwarya College (Autonomous)

Affiliated to Jai Narain Vyas University, Jodhpur

NAAC "A" Grade, Recognised by UGC u/s 2(f) & 12 (B)

BCA

COURSE SCHEME
&
SYLLABUS

AISHWARYA COLLEGE OF EDUCATION (AUTONOMOUS)
Department of Computer Science - Course Name and Credit Scheme
Bachelor of Computer Applications (BCA) I Semester

NCrF Level	S.No	Category	Course		Teaching hours per week and Credit				Marks Distribution		
			Code	Title	Lecture	Tutorial	Lab	Credits	IA	ETE	Total
				Theory							
4.5	1	DCC	PICCC24001T	Programming in C	4	0	0	4	20	80	100
	2	DCC	DGLCC24001T	Digital Logic	4	0	0	4	20	80	100
	3	DCC	MFCCC24001T	Mathematics for Computing	4	0	0	4	20	80	100
	4	SEC	FOISC24001T	Fundamentals of Information Technology	3	0	0	3	20	80	100
	5	AECC	ENGAC24001T	English	3	1	2	4	20	80	100
			Sub Total		**18**	**1**	**2**	**19**	**100**	**400**	**500**
				Practical							
	6	DCC	CPLCC24001P	C Programming Lab	0	0	4	2	20	80	100
	7	DCC	OALCC24001P	Office Automation Lab	0	0	4	2	20	80	100
	8	DCC	ECLCC24001P	English Communication Lab	0	0	4	2	20	80	100
			Sub Total		**0**	**0**	**12**	**6**	**60**	**240**	**200**
			Semester Total		**18**	**1**	**12**	**25**	**160**	**640**	**700**

BCA Semester: I (2025-26)
Discipline Centric Core Course (DCC)
PICCC24001T: Programming in C
(20 CIA + 80 EoSE. = Max. Marks: 100)

Course Credits	No. of Teaching Hours Per Week	Total No. of Teaching Hours
4 Credits	4 Hours	60 Hours

Course Outcome: On successful completion of the course, the students will be able to:
- Understand and apply the basic syntax and structure of C programming.
- Analyze and solve computational problems using appropriate algorithms and logic.
- Write modular and reusable code using functions and recursion.
- Implement and manipulate arrays, strings, and structures effectively.
- Use pointers for efficient memory access and dynamic allocation.

SYLLABUS

Unit-I: Program Concept, Characteristics of Programming, Various stages in Program Development, Algorithm and Flowchart, Programming Techniques – Top down, Bottom up, Modular, Structured, Cohesion & Coupling. Introduction & features of C, Structure of C program, Variable, Tokens: keywords, identifiers, constants, and operators. Data Types: built-in, derived and user defined. Type conversion: Implicit and Explicit.

Unit-II: Operator's classification: based on availability of operands (unary, binary and ternary) and based on specific category: Arithmetic, Assignment, Relational, Logical, Bitwise, increment/ decrement, conditional. Basic input/output and library functions: Single character (Unformatted) input/output i.e. getch(), getchar(). getche(), putchar(),Formatted input output i.e. printf() and scanf(), Library functions - concepts, Mathematical functions: pow(), sqrt(), sin(), tan(), cos().

Unit-III: Control structures / statements: Conditional statements: independent if, if..else, if..elseif ladder, nested if, switch case, Looping: entry controlled and exit controlled and Jump Statements: goto, break, continue, return, exit(). Array: Single and Multi-Dimensional arrays, Array declaration and initialization of arrays, Strings: declaration, initialization, built-in functions: strupr(), strlwr(), strlen(), strrev(), strcat(), strcpy(), strcmp(). Pointers: Declaration, initialization, pointer arithmetic, pointer to pointer, types: generic (void) pointer, NULL pointer.

Unit-IV: Functions: needs, types: User defined: function prototyping, function definition, function calling and library function, categories of function, passing arguments: call by value and call by reference, Recursive function, Array as function argument, Scope and life of variables - local and global variable, Storage class specifier - auto, extern, static, register.

Unit-V: Structure: Defining structure, Declaration of structure variable, Accessing structure members, Union. File Handling Basics: Working with text files

SUGGESTED BOOKS

1. "Programming in ANSI C" – E. Balagurusamy
2. "Let Us C" – YashavantKanetkar
3. "The C Programming Language" – Brian W. Kernighan & Dennis M. Ritchie
4. "Programming with C" – Byron Gottfried (Schaum's Outlines)
5. "Computer Fundamentals and Programming in C" – ReemaThareja

BCA Semester: I (2025-26)
Discipline Centric Core Course (DCC)
DGLCC24001T: Digital Logic
(20 CIA + 80 EoSE. = Max. Marks: 100)

Course Credits	No. of Teaching Hours Per Week	Total No. of Teaching Hours
4 Credits	4 Hours	60 Hours

Course Outcome: On successful completion of the course, the students will be able to:
- Understand the concepts of number systems, binary arithmetic, and logic gates
- Design and simplify Boolean expressions using laws and theorems.
- Design and analyze combinational circuits like multiplexers, demultiplexers, encoders, decoders.
- Understand the design of sequential circuits like flip-flops, counters, and registers.
- Illustrate memory organization and basic digital system architecture.

SYLLABUS

Unit-I: Number Systems and Logic Gates: Introduction to Digital Electronics, Number systems: Binary, Octal, Decimal, Hexadecimal, Conversion between number systems, Binary arithmetic: Addition, subtraction (1's and 2's complement), Logic gates: AND, OR, NOT, NAND, NOR, XOR, XNOR – truth tables and symbols, Logic gate implementation using universal gates

Unit-II: Boolean Algebra and Simplification: Boolean Algebra: Laws and Theorems, DeMorgan's Theorem, Sum of Products (SOP) and Product of Sums (POS), Canonical and Standard Forms, Karnaugh Map (K-Map) simplification (2, 3, 4 variables)

Unit-III: Combinational Logic Circuits: Half Adder and Full Adder, Subtractors, Multiplexers and Demultiplexers, Encoders and Decoders, Comparators, Design and analysis of simple combinational circuits

Unit-IV: Sequential Logic Circuits: Flip-Flops: SR, JK, D, T, Master-Slave JK, Edge-triggered, Registers: Shift registers (SISO, SIPO, PISO, PIPO), Counters: Asynchronous and synchronous counters, Up/Down counters, Ring and Johnson counters, State diagrams and state tables

Unit-V: Memory and Digital System Overview: Classification of memory: RAM, ROM, PROM, EPROM, EEPROM, Memory hierarchy, Basics of memory organization and addressing, Introduction to programmable logic devices (PLDs): PAL, PLA

SUGGESTED BOOKS

1. M. Morris Mano & Michael D. Ciletti – Digital Design, Pearson Education, Latest Edition.
2. R.P. Jain – Modern Digital Electronics, McGraw Hill Education, Latest Edition.
3. Thomas L. Floyd – Digital Fundamentals, Pearson Education.

BCA Semester: I (2025-26)
Discipline Centric Core Course (DCC)
MFCCC24001T: Mathematics for Computing
(20 CIA + 80 EoSE. = Max. Marks: 100)

Course Credits	No. of Teaching Hours Per Week	Total No. of Teaching Hours
4 Credits	4 Hours	60 Hours

Course Outcome: On successful completion of the course, the students will be able to:

- Practical scenarios and determine cardinality and relationships between sets.
- Analyse domain, range, and properties of relations and functions in computational and mathematical contexts.
- Analyse domain, range, and properties of relations and functions in computational and mathematical contexts.
- Apply matrix operations and determinants to solve mathematical and geometric problems.
- Summarize and analyze data using statistical techniques and graphical tools.

SYLLABUS

Unit-I: SETS: Sets, Subsets, Equal Sets Universal Sets, Finite and Infinite Sets, Operation on Sets, Union, Intersection and Complements of Sets, Cartesian Product, Cardinality of Set, Simple Applications.

Unit-II: RELATIONS AND FUNCTIONS: Properties of Relations, Equivalence Relation, Partial Order Relation Function: Domain and Range, Onto, Into and One to One Functions, Composite and Inverse Functions.

Unit-III: PARTIAL ORDER RELATIONS AND LATTICES: Partial Order Sets, Representation of POSETS using Hasse diagram, Chains, Maximal and Minimal Point, Glb, lub, Lattices &Algebric Systems, Principle of Duality, Basic Properties, Sublattices, Distributed & Complemented Lattices.

Unit-IV: MATRICES AND DETERMINANT: Definition and Types of Matrices, Addition, Subtraction and Multiplication of Matrices, Non-commutatively of multiplication of matrices, Scalar Multiplication, Transpose of a Matrix.Determinant: Determinant of a square matrix (up to 3x3 matrices), properties of determinants, minors, cofactors, expansion of determinants, application of determinants in finding the area of a triangle. Adjoint and Inverse of a matrix.

Unit-V: Statistics: Data collection methods, Data classification, Frequency Distribution. Graphical representation of frequency distribution. Measures of Central Tendency - Mean, Median, Mode. Measures of Dispersion - Mean Deviations, Standard Deviations, Variance and Skewness.

SUGGESTED BOOKS

1. C. L. Liu – Elements of Discrete Mathematics, TMH
2. R. D. Sharma - Basic Mathematics
3. S. P. Gupta – Statistical Methods, Sultan Chand & Sons
4. U. Rizwan, Mathematical Foundation - SciTech, Chennai

BCA Semester: I (2025-26)
Skill Enhancement Course (SEC)
FOISC24001T: Fundamentals of Information Technology
(20 CIA + 80 EoSE. = Max. Marks: 100)

Course Credits	No. of Teaching Hours Per Week	Total No. of Teaching Hours
3 Credits	3 Hours	45 Hours

Course Outcome: On successful completion of the course, the students will be able to:
• Understand various basics of computer with its types and hardware architecture
• Understand different types of softwares available in computer
• Explain fundamentals of computer networking
• Understand conceptual model of database
• Explain basics of e-commerce with its applications
SYLLABUS
Unit-I: Introduction to Information Technology: Definition and scope of Information Technology, Evolution of computers, Classification of computers: Micro, Mini, Mainframe, Supercomputers, Characteristics and applications of computers, Block diagram of a computer, Input, Output and Storage Devices
Unit-II: Computer Software and Operating Systems: System Software and Application Software, Operating Systems: Functions and types (DOS, Windows, Linux, Android), Introduction to programming languages: Machine, Assembly, High-level languages, Open-source software and licensing, Utility programs and their types
Unit-III: Data Communication and Networks: Introduction to data communication, Network types: LAN, MAN, WAN, PAN, Topologies: Bus, Ring, Star, Mesh, Hybrid, Internet, Intranet, and Extranet, Basics of IP address, domain names, and DNS, Network devices: Router, Switch, Hub, Modem
Unit-IV: Data and Information Management: Concept of Data, Information, and Knowledge, Types and sources of data, Introduction to databases, File systems vs. DBMS, Basic concepts of data storage and retrieval, Data security and privacy basics
Unit-V: IT Applications and Emerging Trends: Role of IT in business, education, healthcare, and governance, E-Governance, E-Commerce, M-Commerce, Social, legal, and ethical aspects of IT, Cloud Computing and IoT – introduction, Cybersecurity awareness and best practices, Digital India and future IT trends
SUGGESTED BOOKS
1. V. Rajaraman – Introduction to Information Technology, PHI Learning
2. Leon & Leon – Fundamentals of Information Technology, Vikas Publishing
3. Alexis Leon & Mathews Leon – Introduction to Computers, Vikas Publishing

BCA Semester: I (2025-26)
Ability Enhancement Core Course (AECC)
ENGAC24001T: English
(20 CIA + 80 EoSE. = Max. Marks: 100)

Course Credits	No. of Teaching Hours Per Week	Total No. of Teaching Hours
(3L + 1T) Credits	4 Hours	60 Hours

Course Outcome: On successful completion of the course, the students will be able to:
• Students will gain a comprehensive understanding of basic sounds of English and identify key literary forms. • Students will Interpret and appreciate selected poetic and literary texts by Shakespeare, Tagore, and R.K. Narayan, demonstrating a grasp of theme, tone, and literary techniques. • Students will apply knowledge of English grammar structures such as form classes, articles, prepositions, modal auxiliaries, and the use of prefixes, suffixes, and connectives in context.. • Students will explore the concept of Using appropriate tenses, voice (active/passive), and speech (direct/indirect) so as to learn English effectively. • Students will compose formal and informal letters, reports, and job applications with clarity, correct structure, and suitable vocabulary.

SYLLABUS
Unit-I: The Sounds of English: Consonants, Mono-thongs, Diphthongs. An Acquaintance with Literary Forms:- Elegy, Ballad, and Sonnet An Acquaintance with Figures of Speech:- Simile, Metaphor, Personification, and Irony
Unit-II: Poetry : William Shakespeare – All the World is a stage. Rabindranath Tagore – Where the Mind is without Fear. Act Play/Novel: R. K. Narayan – Vendor of Sweets.
Unit-III: Introduction to Form Classes, Tenses and its uses. Articles, Preposition and Modal auxiliaries.
Unit-IV: Active and Passive Voice, Direct and Indirect Speech, Prefixes and Suffixes, Connectives.
Unit-V: English Writing Skills: Formal Letters & Informal Letters, Report Writing, Application for Job / Job Letter.

SUGGESTED BOOKS
1. "An Introduction to Literary Forms" by W.H. Hudson. 2. "The Vendor of Sweets" by R.K. Narayan 3. "English Verse: An Introduction" by David Kennedy 4. "High School English Grammar and Composition" by P.C. Wren & H. Martin. 5. "Effective English Communication" by M.A. Yadugiri&GeethaRajeevan.

BCA Semester: I (2025-26)
Discipline Centric Core Course (DCC)
CPLCC24001P: C Programming Lab
(20 CIA + 80 EoSE. = Max. Marks: 100)

Course Credits	No. of Teaching Hours Per Week	Total No. of Teaching Hours
2 Credits	4 Hours	60 Hours

SUGGESTED LABORATORY EXERCISE
1. Write a program to swap two numbers using a temporary variable.
2. Write a program to find the sum and average of three numbers.
3. Write a program to check whether a number is even or odd using.
4. Write a program to find the largest among three numbers.
5. Write a program to display a simple calculator using switch-case.
6. Write a program to print the multiplication table of a number using loops.
7. Write a program to generate the Fibonacci series up to n terms.
8. Write a program to find the sum and average of elements in a 1D array.
9. Write a program to sort an array in ascending order.
10. Write a program to perform matrix addition and multiplication.
11. Write a program to count the number of vowels in a string.
12. Write a program to find the factorial of a number using recursion.
13. Write a program to demonstrate call by value and call by reference.
14. Write a program to create a structure for student data and display it.
15. Write a mini-project to manage employee records using structures and file handling.

SUGGESTED BOOKS
1. "Programming in ANSI C" – E. Balagurusamy
2. "Let Us C" – YashavantKanetkar
3. "The C Programming Language" – Brian W. Kernighan & Dennis M. Ritchie
4. "Programming with C" – Byron Gottfried (Schaum's Outlines)
5. "Computer Fundamentals and Programming in C" – ReemaThareja

Course Credits	No. of Teaching Hours Per Week	Total No. of Teaching Hours
2 Credits	4 Hours	60 Hours
SUGGESTED LABORATORY EXERCISE		

Part A: MS Word

1. Create a **formal letter** to your principal requesting leave for a personal reason. Use proper formatting:
   - o Font: Times New Roman, Size: 12
   - o Bold the headings and underline the subject.
   - o Insert header with your name and footer with page number.
2. Design a **biodata/resume** using tables, bullet points, and borders.
3. Create a **mail merge** document to send invitations to 10 friends.

Part B: MS Excel

1. Create a **marksheet** for 10 students with fields: Name, Roll No, Subject 1–5, Total, Percentage, Grade.
   - o Use formulas for Total and Percentage.
   - o Use conditional formatting for grades (A, B, C, etc.).
2. Prepare a **monthly expense sheet** using Excel with bar/line chart representation.
3. Use **functions** like SUM, AVERAGE, IF, VLOOKUP/HLOOKUP in sample data.

Part C: MS PowerPoint

1. Design a **5-slide presentation** on any one of the following topics:
   - o Impact of Technology in Education
   - o Cyber Security Basics
   - o Artificial Intelligence in Daily Life
     Include:
   - o Title Slide
   - o At least one image
   - o Use of transitions and animations
   - o Proper use of bullet points and layout

BCA Semester: I (2025-26)

Discipline Centric Core Course (DCC)
ECLCC24001P: English Communication Lab
(20 CIA + 80 EoSE. = Max. Marks: 100)

Course Credits	No. of Teaching Hours Per Week	Total No. of Teaching Hours
2 Credits	4 Hours	60 Hours
SUGGESTED LABORATORY EXERCISE		

SELF DEVELOPMENT

Self-Management: Self-Evaluation, Self-Discipline, Self-Criticism, Self Awareness, Positive Thinking, Perceptions and Attitudes, Values and Belief Systems, Personal success factors, Handling failure, Knowing Yourself, identifying one's strengths and weaknesses.

Activity:

1. Student will describe about him/herself along with their strength and weakness.
2. Students should write their short term and long term goals.

COMMUNICATION SKILLS

Communication: Introduction, Verbal and non-verbal Communication. Listening Skills: Fundamentals of Good Listening. Reading Skills: Comprehension. Speaking Skills: Importance of speaking effectively, speech process, Style, conversation and oral skills, fluency and self expression, body language phonetics and spoken English, speaking techniques, word stress, voice quality, correct tone, positive image projection techniques, Public Speaking, Group discussion.

Activity:

1. Group discussion on current affairs. (at least 2 topics)
2. Students have to listen carefully each discussion and prepare a summary for it.

LANGUAGE AND WRITING SKILLS

Business Writing: Note Making, Letter writing, Writing Formal Letters. Technical Report Writing, Agenda and Minutes of a Meeting, E-Mail. Employment Communication: Job Application, Preparation of CV and Resume writing. Presentation skills: Professional Presentation, Planning a Presentation, Preparing the Presentation, Delivering the Presentation.

Activity:

1. Prepare a report for an IT project.
2. Write a job application and prepare your resume for the same.

LEADERSHIP AND TEAM BUILDING

Leader and Leadership, Culture and Leadership: Salient Features of Corporate Culture, Leadership Styles, Leadership Trends, team Building: Team Development Stages,

Activity:

1. Split students into small groups and have them develop a product, logo, brand name and marketing strategy.
2. Students have to write down 5 positive points in their personality.

INTERVIEW SKILLS

Interview Skills: concept and process, pre-interview planning, opening strategies, answering strategies, interview through tele-conferencing and video-conferencing.

Activity:

1. Organizing mock interviews for the students.
2. Organizing mock meetings for the students