ST. XAVIER'S COLLEGE JAIPUR

Nevta - Mahapura Road, Jaipur - 302029, Rajasthan, India

Affiliated to the University of Rajasthan

Approved under Section 2(f) & 12(B) of the UGC Act, 1956

COURSE OUTCOMES

B.C.A.

(Bachelor of Computer Applications)

Department of Computer Science

As per NEP 2020

Session 2023-24 (Sem. I & II)

Session 2024-25 (Sem III)

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Course Outcomes (COs)

B.C.A. (Part-I) Semester-I

BCA-51T-101: Programming in C

The learners will be able to:

CO 1.	Illustrate the basics of C programming, including its syntax, semantics, and the overall structure of a C program	A
CO 2.	Enumerate the basics of algorithms and flowcharts	K
CO 3.	Write, compile and debug programmes in C language	S
CO 4.	Develop the ability to write modular code by decomposing large problems into smaller, more manageable functions.	S
CO 5.	Develop proficiency in using and manipulating both single-dimensional and multi-dimensional arrays	S
CO 6.	Illustrate string operations and comprehend string handling functions	A
CO 7.	Debug C programs using a range of techniques and tools	S
CO 8.	Handle errors effectively and create robust programs.	S
CO 9.	Use standard libraries and understand their role in simplifying C programming tasks	P

Course Outcomes (COs)

B.C.A. (Part-I) Semester-I

BCA-51P-102: Programming in C Laboratory

The learners will be able to:

CO 1.	Identify different programming approaches in procedural programming	K
CO 2.	Analyse and critically evaluate various programming approaches which will help in the implementation of different applications or projects	A
CO 3.	Compare and contrast different programming approach concepts in project or application development	U
CO 4.	Demonstrate awareness of the programming paradigm in terms of understanding the concept of application development	P
CO 5.	Articulate the significance of writing clean, readable, and well-documented code.	U
CO 6.	Recall coding standards and best practices to ensure high code quality.	K

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Course Outcomes (COs)

B.C.A. (Part-I) Semester-I

BCA-51T-103: Web Development

The learners will be able to:

CO 1.	Articulate the basics of the Internet and concepts like Internet service providers, internet connections, and Internet protocols	U
CO 2.	Elaborate on the basics of e-mail, mailing lists, newsgroups, internet relay chat, and instant messaging	U
CO 3.	Define internet services: Telnet, FTP, and the Web	K
CO 4.	Outline the basics of domain management, DNS settings, and web server configuration.	K
CO 5.	Analyse a web page and identify its elements and attributes.	A
CO 6.	Review the basics of domain management, DNS settings, and web server configuration.	K
CO 7.	Handle project timelines, resources, and deliverables effectively.	S
CO 8.	Develop skills in testing web applications for functionality, performance, and security.	S
CO 9.	Plan, design, and develop complete web projects from concept to deployment	S
CO 10.	Use version control systems like Git for collaborative development.	P
CO 11.	Develop teamwork and communication skills through collaborative projects	S
CO 12.	Use C programming skills to address real-world challenges	A
CO 13.	Create projects that mimic real-life applications and scenarios	S

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Course Outcomes (COs)

B.C.A. (Part-I) Semester-I

BCA-51T-104: Web Development Laboratory

The learners will be able to:

CO 1.	Interpret the details of structure and functionality of web pages and web applications.	U
CO 2.	Develop proficiency in creating responsive and interactive user interfaces using modern front-end frameworks and libraries	S
CO 3.	Create web pages using HTML and Cascading Style Sheets	S
CO 4.	Use CSS frameworks like Bootstrap or Foundation to ensure responsiveness	P
CO 5.	Develop dynamic web pages using JavaScript (Client-side programming).	S
CO 6.	Evaluate responsive web designs that adapt to different devices and screen sizes	E
CO 7.	Identify the deployment of web applications to various hosting platforms	K

Course Outcomes (COs)

B.C.A. (Part-I) Semester-I

BCA-51T-105: Computer Fundamentals & Office

The learners will be able to:

CO 1.	Outline the basics of computers	K
CO 2.	Classify the input and output devices of computers and their functions	U
CO 3.	Summarize the basic terminology used in computer programming	U
CO 4.	Identify and represent numbers in different number systems	K
CO 5.	Analyse and use office automation packages, internet etc.	A
CO 6.	Handle day-to-day office management and e-governance	S
CO 7.	Evaluate software packages in day-to-day activities	E
CO 8.	Create documents through Microsoft Word	S
CO 9.	Explore configuration of operating systems	P

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Course Outcomes (COs)

B.C.A. (Part-I) Semester-I

BCA-51P-106: Office Management Tools Labs

The learners will be able to:

CO 1.	Enumerate the basic features of Microsoft Office, Windows basics, and file management.	K
CO 2.	Explore Word, Excel, Access, PowerPoint, email, and Internet basics	P
CO 3.	Create, edit, format, and manage documents, spreadsheets, presentations, and emails efficiently.	S
CO 4.	Recognise when to use each of the Microsoft Office programmes to create professional and academic documents.	K
CO 5.	Use Microsoft Office programmes to create personal, academic, and business documents following current professional and/or industry standards	P
CO 6.	Use database software and office applications for organizing, storing, and retrieving information.	P
CO 7.	Illustrate data entry, data manipulation, and basic database queries.	A
CO 8.	Use version control and collaborative editing features in office software	P

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Course Outcomes (COs)

B.C.A. (Part-I) Semester-II

BCA-52T-111: Operating System

The learners will be able to:

CO 1.	Tabulate the essential operating system abstractions, including processes, threads, files, semaphores, IPC abstractions, and shared memory regions	K
CO 2.	Evaluate key algorithms, such as process scheduling and memory management algorithms	E
CO 3.	Classify the operating system's resource management, deadlock management, and memory management techniques	U
CO 4.	Manage system administration tasks in LINUX	A
CO 5.	Outline core operating system concepts, including processes, threads, CPU scheduling, memory management, file systems, and I/O systems.	K
CO 6.	Acquire the skills to manage processes and threads, encompassing their creation, scheduling, synchronization, and termination	P
CO 7.	Explore different memory management techniques such as paging, segmentation, and virtual memory, and assess their performance and efficiency	A
CO 8.	Identify and address issues related to resource allocation and deadlocks, including detection, prevention, and recovery techniques.	K
CO 9.	Compare and contrast security and protection mechanisms in operating systems, including authentication, authorization, and encryption methods	E

Course Outcomes (COs)

B.C.A. (Part-I) Semester-II

BCA-52P-112: Operating System

The learners will be able to:

CO 1.	Evaluate and optimise system performance through various techniques, including efficient CPU scheduling, memory management, and I/O processing	E
CO 2.	Explore key components of an operating system, such as a simple scheduler, memory manager, or file system, through lab exercises and projects	P
CO 3.	Analyse Linux operating system architecture, including kernel, shell, and file system structure	A
CO 4.	Develop proficiency in using Linux command-line utilities and tools for system administration and software development	S
CO 5.	Illustrate Linux system administration tasks such as user management, file system management, and package management	P
CO 6.	Write and execute shell scripts for automating tasks and managing system configurations	S
CO 7.	Explore various Linux file systems, their features, and how to manage them effectively	P
CO 8.	Compile and configure custom kernel and kernel modules respectively in Linux Kernel Architecture	S

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Course Outcomes (COs)

B.C.A. (Part-I) Semester-II

BCA-52T-113: Database Management System

The learners will be able to:

CO 1.	Articulate the fundamental concepts and architecture of database management systems	U
CO 2.	Explore data models, schemas, and the relational model	P
CO 3.	Design and implement relational databases using normalisation techniques	S
CO 4.	Develop skills in creating entity-relationship (ER) diagrams and mapping them to relational schemas	S
CO 5.	Acquire proficiency in SQL (Structured Query Language) for querying and manipulating relational databases	P
CO 6.	Explore SQL data definition language (DDL), data manipulation language (DML), and data control language (DCL.	P
CO 7.	Develop normalisation and ER modelling that are used concurrently to produce a good database design	S
CO 8.	Recognise the relationships among entities and the attributes of those entities, and in designing an entity relationship diagram to capture those relationships	K
CO 9.	Develop a set of queries to handle a specified set of typical user inquiries for information extraction from the database	S
CO 10.	Analyze ACID properties (Atomicity, Consistency, Isolation, Durability) and their role in transaction management	A

Course Outcomes (COs)

B.C.A. (Part-I) Semester-II

BCA-52P-114: Database Management System Laboratory

The learners will be able to:

CO 1.	Write complex SQL queries to retrieve and manipulate data from relational databases	S
CO 2.	Use SQL data definition language (DDL), data manipulation language (DML), and data control language (DCL)	P
CO 3.	Explore data modeling and perform CRUD operations (Create, Read, Update, Delete)	P
CO 4.	Identify relational database management system (RDBMS) such as MySQL, PostgreSQL, or SQLite	K
CO 5.	Create tables, define constraints, and manage database objects	S
CO 6.	Create indexes on database tables to optimize query performance	S

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Course Outcomes (COs)

B.C.A. (Part-I) Semester-II

BCA-52T-115: Computer Architecture & Organization

The learners will be able to:

CO 1.	Outline the basic principles and components of computer architecture, including CPU, memory, input/output (I/O) devices, and system buses	K
CO 2.	Explore set design, instruction formats, addressing modes, and assembly language programming	P
CO 3.	Elaborate the design and organisation of modern processors (CPU), including pipelining, superscalar execution, and out-of-order execution	U
CO 4.	Explore memory hierarchy, including cache memory organisation (levels, associativity, replacement policies), main memory (DRAM), and virtual memory	A
CO 5.	Explore input/output systems, including I/O devices, buses, DMA (Direct Memory Access), and interrupt handling mechanisms	A
CO 6.	Enumerate parallel processing and concurrency, including multi-core processors, thread-level parallelism, and SIMD (Single Instruction, Multiple Data) instructions	K
CO 7.	Evaluate the performance of computer systems using metrics such as CPI (Clock Cycles Per Instruction), MIPS (Million Instructions Per Second), and MFLOPS (Million Floating Point Operations Per Second)	E
CO 8.	Demonstrate optimisation techniques such as instruction scheduling, loop unrolling, and cache optimisation.	P
CO 9.	Design and simulate computer systems using hardware description languages (HDL) such as Verilog or VHDL	S
CO 10.	Analyze the design trade-offs and performance implications of different architectural choices	A
CO 11.	Explore emerging trends such as RISC-V architecture, GPU (Graphics Processing Unit) architecture, and quantum computing architectures	A

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Course Outcomes (COs)		
B.C.A. (Part-II) Semester-III		
BCA-63T-201: Data Structures and Algorithms		
The learners will be able to:		
CO 1.	Elaborate the concepts of data structures	U
CO 2.	Outline characteristics, efficiency, and analysis techniques of algorithms	K
CO 3.	Demonstrate basic data structures (such as an array-based list, linked list, stack, queue, binary search tree) and algorithms	P
CO 4.	Design and implement data structures and algorithms	S
CO 5.	Analyse data structures and algorithms on real-world problem	A

Course Outcomes (COs)		
B.C.A. (Part-II) Semester-III		
BCA-63P-202: Data Structures and Algorithms Lab		
The learners will be able to:		
CO 1.	Apply data structures algorithmically to design efficient computer programs that will cope with the complexity of actual applications	A
CO 2.	Figure out linear data structures: arrays, stacks, queues, and their operations	A
CO 3.	Enumerate linked lists, including circular linked lists, and perform insertion and deletion.	K
CO 4.	Analyse and apply tree structures, including binary search trees and tree traversals (Inorder, Preorder, Postorder)	A
CO 5.	Explore graph representation using adjacency matrices/lists and implement graph algorithms	A
CO 6.	Develop searching (sequential, binary, hashing) and sorting (selection, bubble, quick, heap, merge, insertion) algorithms	S

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Course Outcomes (COs)

B.C.A. (Part-II) Semester-III

BCA-63T-203: Object Oriented Programs Using C++

The learners will be able to:

CO 1.	Outline the Principles of Object-Oriented Programming (OOP)	K
CO 2.	Illustrate Object-Oriented Designs in C++	A
CO 3.	Apply Inheritance and Polymorphism	P
CO 4.	Use Standard Template Library (STL)	P
CO 5.	Debug and Optimize C++ Programs	S
CO 6.	Develop Complex Applications	S
CO 7.	Apply Design Patterns	P
CO 8.	Develop Software Projects by working in a team	S

Course Outcomes (COs)

B.C.A. (Part-II) Semester-III

BCA-63P-204: Object Oriented Programs Using C++ Lab

The learners will be able to:		
CO 1.	Explore practical understanding of OOP Concepts	A
CO 2.	Design and Implement C++ Programs	S
CO 3.	Create programs in C++ using Inheritance and Polymorphism	S
CO 4.	Compute Standard Template Library (STL)	U
CO 5.	Debug and Optimize C++ Code	S
CO 6.	Develop File Handling Operations	S
CO 7.	Apply Exception Handling	P
CO 8.	Develop Real-world Applications	S
CO 9.	Develop Software Projects by working in a team	S
CO 10.	Demonstrate Proficiency in C++ Development	P

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Course Outcomes (COs)

B.C.A. (Part-II) Semester-III

BCA-63T-205: Software Engineering

The learners will be able to:

CO 1.	Outline the principles and practices of Software Engineering	K
CO 2.	Define basic concepts of software development such as requirement analysis, designing, testing, and debugging etc.	K
CO 3.	Apply software engineering processes and methodologies to develop software systems	P
CO 4.	Illustrate different types of models that can be used to design software	A
CO 5.	Design solutions to a given problem and analyse the best one based on parameters like cost, time, and knowledge	S
CO 6.	Manage requirement analysis and software design	A
CO 7.	Apply various software testing techniques, testing tools, and quality assurance techniques	P
CO 8.	Illustrate the importance of reliability in software development	A

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