



**PREM CHAND MARKANDA SD COLLEGE FOR WOMEN,
JALANDHAR CITY**

Re-accredited 'A⁺⁺' grade (2nd Cycle) by NAAC Bangalore

A unique prestigious Post Graduate Institution of Northern India

**DEPARTMENT OF PG DEPARTMENT OF COMPUTER SCIENCE & IT
TEACHING PLAN
(Session 2025-26)**

Program: Bachelor of Computer Applications

Program Outcome: PO No.	Upon Completion of the Bachelor of Computer Applications Programme, the graduates will be able to:
PO.1	Gain practical competence with a range of programming languages and tools, such as Java, C++, Python, and SQL. This allows them to design, write, debug, and maintain code for various applications and platforms.
PO.2	Learn Web technologies, including HTML, CSS, JavaScript, and various web development frameworks. Graduates can create dynamic, interactive, and visually appealing web applications.
PO.3	Learn to analyze, design, develop, and test software and computer-based systems for various platforms
PO.4	Prepare for roles in the IT industry as programmers, software developers, testers, system engineers, and more.
PO.5	Gain a solid foundation for pursuing higher education, such as a Master of Computer Applications (MCA), Master of Science (MS) in Information Technology or Master of Science (MS) in Computer Science.

Teaching Plan
Session 2025-26
Odd Semester
CLASS: BCA (Sem-I)
SUBJECT: Computer Fundamentals & PC Software
Faculty Name: Ms. Vineet

TOPIC	DURATION	TEACHING TOOLS
Introduction to Computer, Generations of Computers, Classification of Computers, Computer Applications: Computer as a system, basic concepts – hardware and software, functional units, and their interrelation. Block Diagram showing Central Processing Unit, Memory, and Input/Output Devices. Communication devices. Software: System software and Application software. Programming languages. Hardware: Input Devices- Keyboard, mouse, pens, touch screens, Bar Code reader, joystick, source data automation, (MICR, OMR, OCR), screen assisted data entry: portable/handheld terminals for data collection, voice recognition systems Output Devices: Display Monitors, Printers, Impact Printers, Non-impact Printers, Plotters, Voice Output Systems, Projectors Terminals. Storage Devices: Concept of storage units(bit, byte, KB, MB etc.), Primary storage, Secondary storage, Magnetic storage devices, and Optical Storage Devices.	July-August	• Technology based learning • Lecture based Teaching learning • Group Teaching & Learning
Operating System: meaning, purpose, Windows GUI, Command-line, Powershell overview. File Explorer. Microsoft (MS) Office download and install; different components Word Processing using Microsoft (MS) Word: Overview, creating, saving, opening, importing, exporting and inserting files, formatting pages, paragraphs and sections, indents and outdents, creating lists and numbering. headings, styles, fonts and font size; editing, positioning, and viewing texts; finding and replacing text; inserting page breaks, page numbers, bookmarks, symbols, and dates; using tables, header ,footer, macros, mail-merge; printing setup	September	• Expeditionary learning • Technology-Based Learning

Presentations using MS Powerpoint: Presentation overview, entering information, presentation creation, opening and saving presentation; inserting audio and video, shapes, different views, formatting; playing slides. Spreadsheets using MS Excel: Spreadsheet overview, Editing, Formatting, freeze panes, using formulas and functions, sorting and filtering, pivot tables, charts and Graphs.	October	• Individual learning • Experimental Learning • Peer Teaching
Commencement of University Exams	November	

Course outcome

CO.1	Understand and explain the evolution, classification, and applications of computers along with the basic components of a computer system including input/output devices and communication tools.
CO.2	Differentiate between system software and application software, identify various input/output and storage devices, and explain their roles in data processing and user interaction.
CO.3	Demonstrate basic understanding of operating systems, including GUI-based (Windows), command-line interface, and tools like PowerShell and File Explorer.
CO.4	Develop documents using Microsoft Word, utilizing various features such as formatting, tables, mail merge, macros, headers/footers, and print setup effectively for professional documentation.
CO.5	Create and manage presentations using MS PowerPoint and analyze/organize data using MS Excel with appropriate formatting, formulas, and data handling techniques for decision-making and communication.

Teaching Plan
Session 2025-26
Odd Semester
CLASS: BCA (Sem-I)
SUBJECT: Introduction to Programming using Python
Faculty Name: Dr. Lovely Sharma

TOPIC	DURATION	TEACHING TOOLS
Problem Solving, Problem Analysis, Concept of writing an algorithm, drawing a flowchart, developing a program.; Introduction to Python: Python's features, Story behind the name, Python versions, Execution environments: the Python Interpreter and IDEs (e.g. PyCharm or VSCode), Getting and Setting up Python. Python program structure; writing your first "Hello World" program; creating, saving and executing a program; comments, Indentation.	July-August	• Lecture based Teaching learning • Group Teaching & Learning • Technology based learning
Data and Expressions: Literal Constants, numbers, strings – immutable strings, quotes, the escape sequence, the format method; Variables and Identifiers, data types, object, Operators & Expressions – short cuts, evaluation order, Boolean Expressions (Conditions), Logical Operators. User Input/output Control Flow: Selection Control, Nested conditions, Loops, break and Continue Statements, Data Structures: list, tuple, dictionary and set; basic operations e.g. creating, indexing, slicing, membership Functions: defining and calling functions, passing and returning values, local and global variables, recursive functions, Iteration vs. Recursion	September	• Technology based learning • Expeditionary learning • Inquiry based learning

Modules: purpose and usage, the import statement, from – import statement, the __main__ attribute, creating a module and importing, the dir() function Handling Exceptions – try..catch and with statements, errors, debugging Files and Strings: Opening Files, Using Text Files, Reading files, Writing files, Understanding read functions, Understanding write functions Introduction to numpy and pandas for data processing	October	• Expeditionary learning • Peer Teaching • Technology based learning • Learning through problem solving
Commencement of University Exams	November	

Course outcome

CO.1	Apply problem-solving strategies by formulating algorithms, designing flowcharts, and implementing solutions using Python.
CO.2	Demonstrate proficiency in Python programming fundamentals, including data types, expressions, control structures, and data structures for solving computational problems.
CO.3	Develop modular and reusable code through the use of functions, recursion, and modules, while also employing debugging and exception handling techniques.
CO.4	Analyze and manage data using file handling operations and apply libraries such as NumPy and Pandas for effective data processing.
CO.5	Evaluate program efficiency and correctness by applying appropriate programming constructs and testing strategies in real-world problem scenarios.

Teaching Plan
Session 2025-26
Odd Semester
CLASS: BCA (Sem-I)
SUBJECT: Introduction to Internet
Faculty Name: Ms. Navjot Kaur

TOPIC	DURATION	TEACHING TOOLS
Origin, growth and evolution of the Internet; the impact of the Internet; terminology: web pages, website, web browser, web server, bandwidth; Connect to the Internet: hardware and software, types of Internet connections, Internet Service Providers; Navigating different types of websites and online resources. Student should explore the local market to understand the internet service providers, rates, bandwidth etc. Email Communication: Email Etiquette and Best Practices, Managing and Organizing Emails Email Tools and Features, identifying spam and phishing emails;	July-August	● Projector ● Lecture based Teaching learning ● Group Teaching & Learning
Searching on the Internet: Overview of internet resources and search engines, Basics of Using Search Engines - How search engines work, Basic search techniques and tips, Understanding search engine results pages (SERPs), Using search operators (e.g., AND, OR, NOT), Utilizing advanced search features (e.g., Google Advanced Search), Online Tools for Productivity: Introduction to productivity tools (e.g., Google Workspace, Microsoft Office 365), Cloud storage and file management (e.g., Google Drive, Dropbox), Collaboration and Communication Tools: Online communication etiquette and best practices, using collaboration tools (e.g., Google Docs, Slack, Microsoft Teams), Effective virtual meeting strategies (e.g., Zoom, Google Meet)	September	● Individual learning ● Technology-Based Learning
Building Online Presence: Creating and maintaining a professional online profile (e.g., LinkedIn), Personal branding and digital portfolios, Networking strategies for	October	● Individual learning ● Experimental Learning ● Peer Teaching

academic and career growth, Understanding digital footprints and online reputation. Digital citizenship and respectful online behaviour, balancing screen time and managing digital distractions		
Commencement of University Exams	November	

Course outcome

CO.1	Students will be able to explain the origin, growth, and evolution of the Internet and understand its impact on society.
CO.2	Students will be able to explain the origin, growth, and evolution of the Internet and understand its impact on society.
CO.3	Students will be able to identify and use basic Internet terminology, tools, and connections including ISPs, bandwidth, and web services.
CO.4	Students will be able to utilize online tools for productivity and collaboration (e.g., Google Workspace, Microsoft 365, Zoom, Teams).
CO.5	Students will be able to create and manage a professional online presence while practicing digital citizenship, online etiquette, and responsible use of technology.

Teaching Plan
Session 2025-26
Odd Semester
CLASS: BCA (Sem-III)
SUBJECT: Programming in C
Faculty Name: Ms. Navjot Kaur

TOPIC	DURATION	TEACHING TOOLS
Introduction :-Introduction to Computer Programming, concept of algorithm, flowchart, program structure, Program Development lifecycle - Compiling and executing programs using IDE, command line Fundamentals: Token, Character set, Identifiers and Key Words, Constants, Variables, Expressions, Statements, Symbolic Constants; Data types, declaring variables, initializing variables, types of integers, types of floats, strings, characters C Preprocessor directives: #define Statement, Conditional Compilation, include Files, typedef,enum, Type Casting Operations and Expressions: Arithmetic operators, Unary operators, Relational Operators, Logical Operators, Assignment and Conditional Operators Data Input and Output statements, Library functions	July-August	● Projector ● Lecture based Teaching learning ● Group Teaching & Learning
Control Statements: Preliminaries, While, Do-while and For statements, Nested loops, If-else, Switch, Break – Continue statements. Program Structure Storage Class: Automatic, external and static variables, multiple file programs. Arrays: Defining, processing an array, passing arrays to a function, multi-dimensional arrays Strings: String declaration, string functions and string manipulation.	September	● Individual learning ● Technology-Based Learning
Functions: Brief overview, defining, accessing functions, passing arguments to function, variable scope, specifying argument data types, function prototypes, recursion. Pointers: Fundamentals, pointer declaration, passing pointer to a function, pointer and one-dimensional arrays, operation on pointers, pointers & multi-dimensional arrays of pointers, passing	October	● Individual learning ● Experimental Learning ● Peer Teaching

functions, dynamic memory management. Structures & Unions: Defining and processing a structure, user defined data types, structures and pointers, passing structures to functions, self-referenced structure, unions, Arrays and Structures, File handling in C:- Introduction, file input/output function, binary file and text file.		
Commencement of University Exams	November	

Course outcome

CO.1	Understand the fundamental concepts of computer programming, algorithms, flowcharts, and program development lifecycle.
CO.2	Apply knowledge of tokens, data types, operators, control structures, arrays, strings, and functions to solve computational problems using C language
CO.3	Demonstrate the use of pointers, structures, unions, and dynamic memory management for efficient program design.
CO.4	Develop modular programs using storage classes, recursion, file handling, and multi-file programming concepts.
CO.5	Build problem-solving skills by designing, coding, compiling, debugging, and executing real-world applications in C

Teaching Plan
Session 2025-26
Odd Semester
CLASS: BCA(Sem-III)
SUBJECT: Data Structures & File Processing
Faculty Name: Ms. Deepika

TOPIC	DURATION	TEACHING TOOLS
Basic Data Structures: Introduction to elementary Data Organization and its operations, complexity of Algorithms – Big O-Notation, and Times pace trade off, Sparse Matrix, Arrays and its applications, Searching Techniques: Linear and Binary Search Stack and its applications – postfix notation, expression evaluation, recursion. Linked Lists: Implementation of linked list, singly and doubly linked list, linked list operations with algorithms. Queues: Description of queue structure, implementation of queue using arrays and linked lists, description of priorities queue, Applications of queues.	July-August	• Inquiry based learning • Technology based learning • Peer Teaching
Trees: Description of tree structure and its terminology, binary search tree, AVL Trees, Threaded Binary Trees, B– Trees, B+trees. Graphs: Description of graph structure, implementing graphs in memory using adjacency matrix or adjacency lists, various graphs traversing algorithms, finding shortest path between two nodes.	September	• Lecture based Teaching learning • Group Teaching & Learning
Sorting Technique: Bubble Sort, selection sort, insertion sort, quick sort, merge sort, heapsort File Organization: Concept of field, record, file, blocking and compaction. File Organization Techniques: Sequential	October	• Inquiry based learning • Peer Teaching • Technology based learning

indexed, indexed sequential, Direct, Hashing, Concept of master and transaction files.		
Commencement of University Exams	November	

Course outcome

CO.1	Understand and apply fundamental data structures (arrays, stacks, queues, linked lists, trees, and graphs) and their operations.
CO.2	Analyze algorithm efficiency using Big O Notation and understand time-space trade-offs in problem solving.
CO.3	Implement various searching (linear, binary) and sorting (bubble, selection, insertion, quick, merge, heap) techniques.
CO.4	Design and use file organization methods (sequential, indexed, direct, hashing) and understand file handling concepts.
CO.5	Solve real-world problems using advanced structures like AVL trees, B/B+ trees, priority queues, and graph algorithms.

Teaching Plan
Session 2025-26
Odd Semester
CLASS: BCA (Sem-III)
SUBJECT: Operating Systems

TOPIC	DURATION	TEACHING TOOLS
Introduction: Definition, Early Systems, Simple Batch system, Multi-programming/Multi-Tasking, Time Sharing Systems, Personal Computer System, Parallel Systems, Distributed Systems, Real-time Systems. Processes: Process concept, Inter Process communication, Process Scheduling, Threads. CPU–Scheduling: Basic concepts, Scheduling Criteria, Scheduling Algorithms, Algorithm Evaluation.	July-August	• Lecture based Teaching learning • Group Teaching & Learning • Technology based learning • Peer Teaching
Process Synchronization: Critical – section problem, semaphores, classical problem of synchronization. Semaphores, Threads: Multicore Programming, Multithreading Models, Thread Libraries, Implicit Threading, Threading Issues. Memory Management: Background, Logical v/s Physical address space, swapping, continuous allocation, paging, segmentation.	September	• Expeditionary learning • Technology based learning • Lecture based Teaching learning
Virtual Memory: Background, demand paging, performance of demand paging, page replacement, page replacement algorithms, thrashing. Deadlocks: System Model, Deadlock characterization, methods for handling deadlocks, Deadlocks Prevention, Deadlock avoidance, Deadlock detection, Recovery from deadlock, combined approach to deadlock handling.	October	• Learning through problem solving • Lecture based Teaching learning • Technology based learning

Operating System Security – authentication & authorization, file ownership and user groups, Access Control, password vulnerabilities, strong passwords, Operating System protection from security breaches, such as runaway processes (denial of service), memory-access violations, stack overflow violations, the launching of programs with excessive privileges. Protecting against viruses and worms CASE STUDY – Windows Operating System, Linux		
Commencement of University Exams	November	

Course outcome

CO.1	Explain the evolution, structure, and types of operating systems, along with fundamental concepts of processes, CPU scheduling, and inter-process communication.
CO.2	Apply principles of process synchronization, memory management, and multithreading models to solve practical operating system problems.
CO.3	Analyze virtual memory mechanisms, page replacement strategies, and approaches to handling deadlocks in complex computing environments.
CO.4	Evaluate operating system security mechanisms, including authentication, access control, and protection against vulnerabilities such as denial of service and malware.
CO.5	Compare and contrast features of contemporary operating systems (e.g., Windows and Linux) through case studies to understand their design and implementation.

Teaching Plan
Session 2025-26
Odd Semester
CLASS: BCA Sem III
SUBJECT: Cyber Security

Faculty Name: Ms. Vineet

TOPIC	DURATION	TEACHING TOOLS
Introduction to the Internet, IP address, MAC address; Client-Server/P2P Architecture, Cloud Computing; Computation/ Storage as a service; confidentiality, Integrity, availability of information; desktop and mobile apps; Authentication & authorization; Data trails of an Internet user; cookies; Why security matters? Malicious software, Cyber threats, hackers, trackers, types of hackers, hacker motives; Types of Attacks: virus, worms, Trojan horse, spam, spoofing, phishing, spear-phishing, whaling, social engineering, ransomware, spyware, adware, malvertising supply-chain attacks, zero-day viruses - software/hardware vulnerabilities, exploits;	July-August	● Experimental Learning ● Traditional Learning ● Individual Learning
denial of service attacks; bots, botnets; Data breaches; risks of using public Wi-Fi; Cyber bullying; Using http/https; Anti-virus software, analysis of the tools available in the market; strong passwords/passphrases, password managers, changing passwords regularly; Cryptography: Encryption, Decryption, public/private cryptography, Digital signatures; Virtual private networks; Setting up private and secure Wi-Fi; Data backup and recovery – full/incremental/differential backup,	September	● Technology-Based Learning ● Experimental Learning ● Peer Teaching

backup vs archive; software updates/patches; URL		
privacy vs security vs anonymity, privacy settings in apps/browsers and popular social networking sites such as Facebook, Instagram, Snapchat; using web browser incognito mode, the tor browser; Laws, regulations, and compliance; cybercrimes, Intellectual Property, Licensing, Compliance, Provisions in the IT	October	● Group Discussion ● Individual Learning ● Experimental Learning
Commencement of Exams	November	

Course outcome

CO.1	Understand the fundamentals of the Internet, including IP and MAC addresses, network architectures (Client-Server, P2P), cloud computing, and the basic principles of information security such as confidentiality, integrity, and availability.
CO.2	Identify various cyber threats, types of attacks (e.g., malware, phishing, ransomware), hacker categories, and risks such as data breaches and public Wi-Fi vulnerabilities.
CO.3	Apply effective cybersecurity practices including the use of antivirus software, strong password management, encryption techniques, VPNs, and regular system updates to safeguard data and devices.
CO.4	Demonstrate awareness of cyber laws, intellectual property rights, and IT regulations, and understand the legal implications of cybercrimes and the importance of compliance in the digital world.

Teaching Plan
Session 2025-26
Odd Semester
CLASS: BCA (Sem-III)
SUBJECT: INFORMATION SYSTEMS
Faculty Name: Prof. Shivani Sharma

TOPIC	DURATION	TEACHING TOOLS
An Introduction to Information System: Information Concepts, System Concepts, Business Information Systems, Information Systems in society, business and Industry, Ethical and Social issues, Global Challenges in Information Systems Information Systems in Organizations: organizations and Information systems, competitive Advantage, careers in Information System	July-August	● PowerPoint / Google Slides ● Smart Board explanations of Information system Concepts
Management Information System: Fundamental types of Management, Information Systems, Management Decision, Pitfalls in MIS Development Making Process Building and Maintaining Information Systems, Information System Security and Control	September	● Create diagrams for system design, information flow, network architecture ● Show online material on IS concepts
Decision Support Systems (DSS): Conceptual Foundations of DSS, Concepts of DSS, DSS Software, Strategies for DSS, Group Support Systems, Executive Support System (ESS); Expert systems, Expert System & its integration with DSS.	October	● Organize group discussions on MIS, TPS, OOS, DSS, Expert System ● Give Assignment work to students
Knowledge Management systems: Fundamentals of Knowledge Management; importance; The Knowledge Management Process; knowledge spiral; Knowledge Repositories and Databases; Knowledge Sharing Practices; Collaboration Tools: Email, Social Media, Enterprise Social Networks (e.g., Slack, Microsoft Teams). Other	November	● Real-time quizzes, polls, and brainstorming

Information Systems like Supply chain management, Customer Relationship Management (CRM), Electronic Commerce and Mobile Commerce.		
--	--	--

Course outcome

CO.1	Explain the basic concepts, components, and types of information systems used in organizations
CO.2	Describe the role of information systems in business operations and decision-making.
CO.3	Evaluate the impact of IS on organizational efficiency and competitive advantage.
CO.4	Learn basic systems development life cycle (SDLC) concepts.
CO.5	Differentiate between Transaction Processing Systems (TPS), Management Information Systems (MIS), Decision Support Systems (DSS), and Enterprise Resource Planning (ERP) systems.

Teaching Plan
Session 2025-26
Odd Semester
CLASS: BCA SEM(V)
SUBJECT: Software Engineering
Faculty Name: Ms. Navjot Kaur

TOPIC	DURATION	TEACHING TOOLS
Introduction to Software: Definition, Software characteristics, Software components, Software Applications. Introduction to Software Engineering: Definition, Software Engineering Paradigms, waterfall method, prototyping, interactive Enhancement, The Spiral model, Fourth Generation Technique. Software Metrics: Role of Metrics and measurement, Metrics for software productivity and quality, Measurement software, size-oriented metrics, function-oriented metrics, Metrics for software quality.	July-August	• Expeditionary learning • Peer Teaching • Technology based learning
Software Requirement Specification (SRS): Problem analysis, structuring information, Data flow diagram and data dictionary, structured analysis, Characteristics and component of (SRS). Planning a Software Project: Cost estimation, uncertainties in cost estimation, Single variable model, COCOMO model, On software size estimation, Project scheduling and milestones, Software & Personal Planning, Rayleigh curve, Personal Plan, Quality Assurance Plan, Verification & Validation (V & V), inspection & review. System Design: Design Objectives, Design Principles, problem, Partitioning, Abstraction, Top Down and Bottom-up	September	• Learning through problem solving • Inquiry based learning

techniques.		
Coding: Coding by Top-down and Bottom-up, Structured Programming, Information Hiding, Programming style, Internal Documentation. Testing: Level of testing, Test cases and test criteria, Functional Testing, Structural Testing. System Maintenance: Types of Maintenance, Corrective and Preventive Maintenance.	October	• Learning through problem solving • Lecture based Teaching learning • Technology based learning
Commencement of exams	November	

Course outcome

CO.1	Understand the fundamental concepts of software, its characteristics, components, and applications.
CO.2	Apply software engineering process models such as Waterfall, Prototyping, Spiral, and Iterative approaches for project development
CO.3	Develop Software Requirement Specifications (SRS), perform cost estimation, scheduling, and planning using models like COCOMO.
CO.4	Design, code, and test software systems using structured methods, design principles, and appropriate testing strategies.
CO.5	Demonstrate knowledge of software quality assurance, verification & validation, and maintenance techniques for reliable software development

Teaching Plan
Session 2025-26
Odd Semester
CLASS: BCA Sem(V)
SUBJECT: Web Technologies
Faculty Name: Mrs. Sumanjit Kaur

TOPIC	DURATION	TEACHING TOOLS
Introduction to websites, Static vs dynamic websites, server side and client side scripting HTML 5 : Introduction , Structure of a web page , HTML Elements, HTML attributes, Basic Text Formatting tags, Comments, Links, Lists, Image, Style, Forms, Table, Media, Classes, iframes. CSS3 : Introduction , stylesheets , selectors , styling – backgrounds, texts , fonts , links , lists , tables , Box model JAVASCRIPT: Introduction, datatypes, variables, comments ,Operators, functions and events, basics of JQuery and AJAX	July-August	• Learning through problem solving • Inquiry based learning
Introduction to PHP, basics, Data types, variables, comments, control statements, functions, PHP with web design, working with files, uploading a file, sessions, cookies, error handling , database connectivity with mysql . HOSTING : Overview of Domain , Hosting , SSL Certificates and steps to host a website online. Introduction to Emerging Web Technologies: Introduction to Chatbot, Artificial Intelligence and Machine Learning basics used in websites.	September	• Learning through problem solving • Lecture based Teaching learning • Technology based learning
EMERGING WEB TECHNOLOGIES: Basics of Internet Of Things (IOT) used in Websites, Basics of BlockChain Technology in Websites, Augmented Reality and Virtual Reality and Basics of Single page applications websites using Angular.	October	• Expeditionary learning • Peer Teaching • Technology based learning
Commencement of exams	November	

Course outcome

CO.1	Understand the fundamentals of website development, including static vs. dynamic websites, client-side, and server-side scripting.
CO.2	Apply HTML5 and CSS3 to design structured, styled, and interactive web pages with forms, tables, multimedia, and responsive layouts.
CO.3	Use JavaScript, jQuery, and AJAX to add interactivity, handle events, and enable dynamic content on websites.
CO.4	Develop server-side applications using PHP with database connectivity, file handling, sessions, cookies, and error handling
CO.5	Demonstrate knowledge of hosting, domain management, SSL, and emerging web technologies such as IoT, Blockchain, AI/ML, AR/VR, and single-page applications.

Teaching Plan
Session 2025-26
Odd Semester
CLASS: BCA (Sem-V)
SUBJECT: Operating System
Faculty Name: Prof. Shivani Sharma

TOPIC	DURATION	TEACHING TOOLS
Definition, Early Systems, Simple Batch system, Multi programmed Batch. Time Sharing Systems, Personal Computer System, Parallel Systems, Distributed Systems, Real-time Systems. Processes: Process concepts, Process Scheduling, Threads Basic concepts, Scheduling Criteria, Scheduling Algorithms, Algorithm Evaluation.	July-August	● Use of Powerpoint slides ● Smart Board explanations, to explain OS architecture, and algorithms.
Critical – section problem, semaphores, classical problem of synchronization. Memory Management: Background, Logical v/s Physical address space, swapping, continuous allocation, paging, segmentation.	September	● Analyze operating systems like Unix/Linux, Windows, or Android to understand how theory applies in practice.
Virtual Memory: Background, demand paging, performance of demand paging, page replacement, page replacement algorithms, thrashing. Secondary Storage Structures: Disk structures, Disk scheduling, Disk Reliability.	October	● Organize group discussions on OS problems (e.g., deadlocks, memory allocation) or peer presentations on specific OS modules.
Deadlocks: System Model, Deadlock characterization, methods for handling deadlocks, Deadlocks Prevention, Deadlock avoidance, Deadlock detection, Recovery from deadlock, combined approach to deadlock handling.	November	● Videos, animations, and interactive learning of processes like CPU scheduling and paging can help students visualize OS behavior.

Course outcome

CO.1	Summarize OS functionalities like memory management, process scheduling, file systems, and concurrency
CO.2	Describe the mechanisms and algorithms used in OS design
CO.3	Understand how OS abstractions are mapped to hardware

CO.4	Apply OS principles to solve problems in computing, such as selecting appropriate OS features for specific applications and even writing code to emulate basic OS functions
CO.5	Apply OS knowledge to solve practical computing problems and select the most suitable operating system for a given context or application.

Teaching Plan
Session 2025-26
Odd Semester
CLASS: BCA (Sem-V)
SUBJECT: JAVA Programming Language
Faculty Name: Dr. Lovely Sharma

TOPIC	DURATION	TEACHING TOOLS
JAVA BASICS: Introduction to Java, Features of Java, Structure of a Java Program, primitive data types, keywords, Identifiers, literals, operators and comments. OOPS: Object Oriented concepts Advantage of OOPs, Objects and Classes, Strings: Declaring a string, Immutable string, string comparison, concatenation, substring, string tokenizer. Inheritance: what is inheritance, types of inheritance, static import, Method overloading, method overriding, Runtime polymorphism, super keyword, final keyword Interfaces: Abstract classes, declaring an interface, relationship between classes and interface, interface inheritance, implementing multiple inheritance using interface	July-August	• Lecture based Teaching learning • Group Teaching & Learning • Technology based learning • Expeditionary learning
Exception Handling: what is exception handling, checked and unchecked exceptions, try-catch, try-multiple catch, try – finally, throw and throws Multithreading: What is a thread, life cycle of a thread, creating a thread ,sleeping a thread , joining a thread , thread priority. Packages: what are packages, advantages of using packages, accessing package from another package, subpackaging, running packages by	September	• Expeditionary learning • Peer Teaching • Technology based learning

setting path and classpath.		
Input/Output: File input stream, File output stream, Buffered output stream, Buffered input stream. Database connectivity: JDBC, JDBC drivers, steps to connect to the database, connectivity with MYsql	October	• Learning through problem solving • Inquiry based learning • Technology based learning
Commencement of exams	November	

Course Outcome-

CO.1	Basics of Java programming, including data types, operators, and control structures, enabling foundational skills for building robust applications.
CO.2	Object-oriented principles (OOPs), including classes, objects, inheritance, and polymorphism, to design modular and reusable software systems.
CO.3	String manipulation, method overloading/overriding, and advanced OOP features like interfaces and packages, which are essential for large-scale application development.
CO.4	Exception handling techniques for error-free coding and multithreading for building concurrent and performance-oriented applications.
CO.5	File I/O operations for data handling and JDBC for connecting Java applications to databases like MySQL, a key skill for backend development.