

RAM LAKHAN SINGH YADAV COLLEGE

Kokar, Ranchi

Department of Vocational Courses

Bachelor of Computer Application(BCA)



Academic Calendar (2023-2024)

Faculty Members

1. Dr Md Ibrar
2. Mr Bharat Bhushan

Faculty Member: Dr Md Ibrar

Session (2021-2024)

Semester- 5

PAPER: C-12(Theory of Computation)

Month	Topics	Completed/Not Completed
July	Languages: Alphabets, string, language, Basic Operations on language, Concatenation, Kleene Star	Completed
August	Finite Automata and Regular Languages: Alphabets, string, language, Basic Operations on language, Concatenation, Kleene Star	Completed
September	Regular languages and their relationship with finite automata, Pumping lemma and closure properties of regular languages.	Completed
October	Context free grammars: parse trees, ambiguities in grammars and languages, Pushdown automata (Deterministic and Non-deterministic),	Completed
November	Pumping Lemma, Properties of context free languages, normal forms. Introduction to Turing Machines and Models of Computations, RAM, Turing Machine as a model of computation, Universal Turing Machine, Language acceptability,	Completed
December	Turing Machine, decidability, halting problem, Recursively enumerable and recursive languages, unsolvability problems.	Completed

Faculty Member: Dr Md Ibrar

Session (2021-2024)

Semester- 5

PAPER: DSE - 2(Cloud Computing)

Month	Topics	Completed/Not Completed
July	Overview of Computing Paradigm: Recent trends in Computing : Grid Computing, Cluster Computing, Distributed Computing, Utility Computing, Cloud Computing,	Completed
August	Introduction to Cloud Computing: Introduction to Cloud Computing, History of Cloud Computing, Cloud service providers, Benefits and limitations of Cloud Computing,	Completed
September	Cloud Computing Architecture: Comparison with traditional computing architecture (client/server), Services provided at various levels, Service Models- Infrastructure as a Service(IaaS), Platform as a Service(PaaS), Software as a Service(SaaS), How Cloud Computing Works, Deployment Models- Public cloud, Private cloud, Hybrid cloud, Community cloud, Case study of NIST architecture.	Completed
October	Case Studies: Case study of Service model using Google App Engine, Microsoft Azure, Amazon EC2 , Eucalyptus.	Completed
November	Service Management in Cloud Computing: Service Level Agreements(SLAs), Billing & Accounting, Comparing Scaling Hardware: Traditional vs. Cloud, Economics of scaling.	Completed
December	Cloud Security: Infrastructure Security- Network level security, Host level security, Application level security, Data security and Storage- Data privacy and security Issues, Jurisdictional issues raised by Data location, Authentication in cloud computing.	Completed

Faculty Member: Mr. Bharat Bhushan

Session (2021-2024)

Semester- 5

PAPER: C-11(Internet Technologies)

Month	Topics	Completed/Not Completed
July	Introduction to Advanced Java: Java Use of Objects, Array and Array List class	Completed
August	Java Script: Data types, operators, functions, control structures, events and event handling	Completed
September	JDBC: JDBC Fundamentals, Establishing Connectivity and working with connection interface, Working with statements, Creating and Executing SQL Statements, Working with Result Set Objects.	Completed
October	Introduction to Java Server Pages, HTTP and Servlet Basics, The Problem with Servlets, The Anatomy of a JSP Page, JSP Processing, JSP Application Design with MVC, Setting Up the JSP Environment, Implicit JSP Objects, Conditional Processing,	Completed
November	Displaying Values, Using an expression to Set an Attribute, Declaring Variables and Methods, Error Handling and Debugging, Sharing Data Between JSP Pages, Requests, and Users, Database Access.	Completed
December	Java Beans: Java Beans Fundamentals, JAR files, Introspection, Developing a simple Bean, Connecting to DB	Completed

Faculty Member: Mr. Bharat Bhushan

Session (2021-2024)

Semester- 5

PAPER: DSE-2(Information Security)

Month	Topics	Completed/Not Completed
July	Introduction Security, Attacks, Computer Criminals, Security Services, Security Mechanisms. Introduction to Cryptography	Completed
August	Substitution ciphers, Transpositions Cipher, Confusion, diffusion, Symmetric, Asymmetric Encryption. DES Modes of DES, Uses of Encryption, Hash function, key exchange, Digital Signatures, Digital Certificates.	Completed
September	Program Security Secure programs, Non malicious Program errors, Malicious codes virus, Trap doors, Salami attacks, Covert channels, Control against program	Completed
October	Threats. Protection in OS: Memory and Address Protection, Access control, File Protection, User Authentication.	Completed
November	Database Security Requirements, Reliability, Integrity, Sensitive data, Inference, Multilevel Security. Security in Networks Threats in Networks, Security Controls, firewalls, Intrusion detection systems, Secure e-mails	Completed
December	Administrating Security Security Planning, Risk Analysis, Organizational Security Policy, Physical Security. Ethical issues in Security: Protecting Programs and data. Information and law.	Completed

Faculty Member: Dr Md Ibrar

Session (2021-2024)

Semester- 6

PAPER: C-14(Computer Graphics)

Month	Topics	Completed/Not Completed
January	Introduction : Computer Graphics Basic elements of Computer graphics, Applications of Computer Graphics.	Completed
February	Graphics Hardware: Architecture of Raster and Random scan display devices, input/output devices.	Completed
March	Fundamental Techniques of Graphics: Raster scan line, circle and ellipse drawing, thick primitives, Polygon filling, line and polygon clipping algorithms, 2D and 3D Geometric Transformations, 2D and 3D Viewing Transformations	Completed
April	Geometric Modeling Representing curves & Surfaces.	Completed
May	Visible Surface determination Hidden surface elimination. Surface rendering,Illumination and shading models.	Completed
June	Surface rendering: Basic color models and Computer Animation.	Completed

Faculty Member: Mr. Bharat Bhushan

Session (2021-2024)

Semester- 6

PAPER: C-13(Artificial Intelligence)

Month	Chapters	Completed/Not Completed
January	Introduction: Introduction to Artificial Intelligence, Background and Applications, Turing Test and Rational Agent approaches to AI, Introduction to Intelligent Agents, their structure, behavior and environment.	Completed
February	Problem Solving and Searching Techniques: Problem Characteristics, Production Systems, Control Strategies, Breadth First Search, Depth First Search, Hill climbing and its Variations, Heuristics Search Techniques: Best First Search, A* algorithm, Constraint Satisfaction Problem, Means-End Analysis, Introduction to Game Playing, Min-Max and Alpha-Beta pruning algorithms.	Completed
March	Knowledge Representation: Introduction to First Order Predicate Logic, Resolution Principle, Unification, Semantic Nets, Conceptual Dependencies, Frames, and Scripts, Production Rules, Conceptual Graphs. Programming in Logic (PROLOG)	Completed
April	Maintenance System, Default Reasoning, Probabilistic Reasoning, Bayesian Probabilistic Inference, Possible World Representations..	Completed
May	Understanding Natural Languages: Parsing Techniques, Context-Free and Transformational Grammars, Recursive and Augmented Transition Nets.	Completed
June	Artificial Intelligence Applications and tools	Completed

Faculty Member: Mr. Bharat Bhushan

Session (2021-2024)

Semester- 6

PAPER: DSE-3(Numerical Methods)

Month	Chapters	Completed/Not Completed
January	Floating point representation and computer arithmetic, Significant digits, Errors: Round-off error, Local truncation error, Global truncation error, Order of a method, Convergence and terminal conditions, Efficient computations, Bisection method, Secant method, Regula-Falsi method	Completed
February	Newton-Raphson method, Newton's method for solving nonlinear systems. Gauss elimination method (with row pivoting) and Gauss-Jordan method, Gauss Thomas method for tridiagonal systems	Completed
March	Iterative methods: Jacobi and Gauss-Seidel iterative methods, Interpolation: Lagrange's form and Newton's form, Finite difference operators, Gregory Newton forward and backward differences Interpolation	Completed
April	Piecewise polynomial interpolation: Linear interpolation, Cubic spline interpolation (only method), Numerical differentiation: First derivatives and second order derivatives, Richardson extrapolation	Completed
May	Numerical integration: Trapezoid rule, Simpson's rule (only method), Newton-Cotes open formulas, Extrapolation methods: Romberg integration, Gaussian quadrature, Ordinary differential equation: Euler's method, Modified Euler's methods: Heun method and Mid-point method, Runge-Kutta second methods:	Completed
June	Heun method without iteration, Mid-point method and Ralston's method Classical 4th order Runge-Kutta method, Finite difference method for linear ODE	Completed

Session (2022-2025)**Semester- 3****PAPER: C-7(Computer Networks)**

Month	Chapters	Completed/Not Completed
July	Introduction: Network definition; network topologies; network classifications; network protocol; layered network architecture; overview of OSI reference model; overview of TCP/IP protocol suite.	Completed
August	Data Communication Fundamentals and Techniques Analog and digital signal; data-ratelimits; digital to digital line encoding schemes; pulse code modulation; parallel and serial transmission; digital to analog modulation-; multiplexing techniques FDM, TDM; transmission media	Completed
September	Circuit switching; packets witching-connectionless datagram switching, connection-oriented virtual circuit switching; dial-up modems; digital subscriber line; cable TV for data transfer. Error detection and error correction techniques ;data-link control- framing and flow control; error recovery protocols- stop and wait ARQ, go-back-n ARQ; Point to Point Protocol on Internet.	Completed
October	CSMA/CD protocols; Ethernet LANS; connecting LAN and back-bone networks- repeaters, hubs, switches, bridges, router and gateways,	Completed
November	Routing; routing algorithms; network layer protocol of Internet- IP protocol, Internet control protocols. Overview of DNS protocol; overview of WWW & HTTP protocol.	Completed
December	Transport services- error and flow control, Connection establishment and release- three way handshake;	Completed

Session (2022-2025)**Semester- 3****PAPER: SEC-1(Elementary Computer)**

Month	Chapters	Completed/Not Completed
July	Basic Computer Concept Computer Appreciation - Characteristics of Computers, Input, Output, Storage units, CPU, Computer System	Completed
August	Input and Output Devices Input Devices - Keyboard, Mouse, joystick, Scanner, web cam, Output Devices- Soft copy devices, monitors, projectors, speakers, Hard copy devices, Printers – Dot matrix, inkjet, laser, Plotters.	Completed
September	Computer Memory and Processors Memory hierarchy, Processor registers, Cache memory, Primary memory- RAM, ROM, Secondary storage devices, Magnetic tapes, Floppy disks, hard disks, Optical Drives- CD-ROM, DVD-ROM, CD R, CD-RW, USB Flash drive, Mass storage devices: USB thumb drive. Managing disk Partitions, File System. Basic Processor Architecture, Processor speed, Types of processor.	Completed
October	Numbers Systems and Logic Gates Decimal number system, Binary number system, Octal number system, Hexadecimal number system, Inter-conversion between the number systems. Basic Logic gates-AND, OR, NOT, Universal logic gates-NAND, NOR	Completed
November	Computer Software Computer Software- Relationship between Hardware and Software, System Software, Application Software, Compiler, Names of some high level languages, Free domain software. History of Internet, WWW and Web Browsers: Web Browsing software, Surfing the Internet, Chatting on Internet, Basic of electronic mail, Using Emails, Document handling, Network definition, Common terminologies: LAN, WAN, MAN, Node, Host, Workstation, Bandwidth, Network Components: Servers, Clients, Communication Media. Wireless network	Completed
December	Operating system-Windows Operating system and basics of Windows, The User Interface, Using Mouse and Moving Icons on the screen, The My Computer Icon, The Recycle Bin, Status Bar, Start and Menu & Menu-selection, Running an Application, Windows Explorer Viewing of File, Folders and Directories, Creating and Renaming of files and folders, Opening and closing of different Windows, Windows Setting, Control Panels, Wall paper and Screen Savers, Setting the date and Sound, Concept of menu Using Help, Advanced Windows, Using right Button of the Mouse, Creating Short cuts, Basics of Window Setup, Notepad, Window Accessories MS Office	Completed

Session (2022-2025)**Semester- 3****PAPER: C-5(Data Structures)**

Month	Topics	Completed/Not Completed
July	<p>Array: Single and Multi-dimensional Arrays, Sparse Matrices (Array and Linked Representation)</p> <p>Stacks: Implementing single / multiple stack/s in an Array; Prefix, Infix and Postfix expressions, Utility and conversion of these expressions from one to another; Applications of stack; Limitations of Array representation of stack</p>	Completed
August	<p>Linked List: Singly, Doubly and Circular Lists (Array and Linked representation); Normal and Circular representation of Stack in Lists; Self Organizing Lists; Skip Lists</p> <p>Queues: Array and Linked representation of Queue, De-queue, Priority Queues</p>	Completed
September	<p>Recursion: Developing Recursive Definition of Simple Problems and their implementation; Advantages and Limitations of Recursion; Understanding what goes behind Recursion (Internal Stack</p>	Completed
October	<p>Trees: Introduction to Tree as a data structure; Binary Trees (Insertion, Deletion , Recursive and Iterative Traversals on Binary Search Trees); Threaded Binary Trees (Insertion, Deletion, Traversals); Height Balanced Trees (Various operations on AVL Trees).</p>	Completed
November	<p>Searching and sorting: Linear Search, Binary Search, Comparison of Linear and Binary Search, Selection Sort, Insertion Sort, Insertion Sort, Shell Sort, Comparison of Sorting Techniques</p>	Completed
December	<p>Hashing: Introduction to Hashing, Deleting from Hash Table, Efficiency of Rehash Methods, Hash Table Reordering, Resolving collusion by Open Addressing, Coalesced Hashing, Separate Chaining, Dynamic and Extendible Hashing, Choosing a Hash Function, Perfect Hashing Function</p>	Completed

Faculty Member: Mr. Bharat Bhushan

Session (2022-2025)

Semester- 3

PAPER: C-6(Operating System)

Month	Topics	Completed/Not Completed
July	Introduction: Basic OS functions, resource abstraction, types of operating systems–multiprogramming systems, batch systems , time sharing systems; operating systems for personal computers & workstations, process control & real time systems.	Completed
August	Operating System Organization: Processor and user modes, kernels, system calls and system programs	Completed
September	Process Management: System view of the process and resources, process abstraction, process hierarchy, threads, threading issues, thread libraries; Process Scheduling, non-pre-emptive and pre-emptive scheduling algorithms; concurrent and processes, critical section, semaphores, methods for inter-process communication; deadlocks.	Completed
October	Physical and virtual address space; memory allocation strategies -fixed and variable partitions, paging, segmentation, virtual memory	Completed
November	Files and I/O management: Directory structure, file operations, file allocation methods, device management.	Completed
December	Protection and Security: Policy mechanism, Authentication, Internal access Authorization	Completed

Session (2022-2025)**Semester- 4****PAPER: C-9(Software Engineering)**

Month	Topics	Completed/Not Completed
January	Introduction: The Evolving Role of Software, Software Characteristics, Changing Nature of Software, Software Engineering as a Layered Technology, Software Process Framework, Framework and Umbrella Activities, Process Models, Capability Maturity Model Integration (CMMI).	Completed
February	Requirement Analysis: Software Requirement Analysis, Initiating Requirement Engineering Process, Requirement Analysis and Modelling Techniques, Flow Oriented Modelling, Need for SRS, Characteristics and Components of SRS.	Completed
March	Software Project Management: Estimation in Project Planning Process, Project Scheduling. Risk Management: Software Risks, Risk Identification, Risk Projection and Risk Refinement, RMMM Plan.	Completed
April	Quality Management : Quality Concepts, Software Quality Assurance, Software Reviews, Metrics for Process and Projects	Completed
May	Design Engineering: Design Concepts, Architectural Design Elements, Software Architecture, Data Design at the Architectural Level and Component Level, Mapping of Data Flow into Software Architecture, Modelling Component Level Design.	Completed
June	Testing Strategies & Tactics : Software Testing Fundamentals, Strategic Approach to Software Testing, Test Strategies for Conventional Software, Validation Testing, System testing, Black-Box Testing, White-Box Testing and their type, Basis Path Testing.	Completed

Faculty Member: Dr Md Ibrar

Session (2022-2025)

Semester- 4

PAPER: C-10(Database Management System)

Month	Topics	Completed/Not Completed
January	Introduction: Characteristics of database approach, data models, database system architecture and data independence	Completed
February	Entity Relationship Modelling: Entity types, relationships, constraints	Completed
March	Relational Data Model: Relational model concepts, relational constraints, relational algebra, SQL queries	Completed
April	Database Design: Mapping ER/EER model to relational database, functional dependencies, Lossless decomposition, Normal forms (upto BCNF). ACID properties, concurrency control	Completed
May	File Structures and Indexing: Operations on files, File of Unordered and ordered records, overview of File organizations, Indexing structures for files(Primary index, secondary index, clustering index),	Completed
June	Multilevel indexing using B and B+ trees.	Completed

Faculty Member: Mr. Bharat Bhushan

Session (2022-2025)

Semester- 4

PAPER: C-8(Design and Analysis of Algorithm)

Month	Topics	Completed/Not Completed
January	Introduction: Basic Design and Analysis techniques of Algorithms, Correctness of Algorithm.	Completed
February	Algorithm Design Techniques: Iterative techniques, Divide and Conquer, Dynamic Programming, Greedy Algorithms.	Completed
March	Sorting and Searching Techniques: Elementary sorting techniques–Bubble Sort, Insertion Sort, Merge Sort, Advanced Sorting techniques - Heap Sort, Quick Sort, Sorting in Linear Time - Bucket Sort, Radix Sort and Count Sort, Searching Techniques, Medians & Order Statistics, complexity analysis;	Completed
April	Lower Bounding Techniques: Decision Trees Balanced Trees: Red-Black Trees	Completed
May	Advanced Analysis Technique: Amortized analysis Graphs introduction	Completed
June	Graph Algorithms–Breadth First Search, Depth First Search and its Applications, Minimum Spanning Trees.	Completed

Faculty Member: Mr. Bharat Bhushan

Session (2022-2025)

Semester- 4

PAPER: SEC-2(HTML Programming and PHP)

Month	Topics	Completed/Not Completed
January	Introduction to HTML : The Basics , The Head, the Body Colors, Attributes Lists, ordered and unordered Links Introduction Relative Links, Absolute Links Link Attributes Using the ID Attribute to Link Within a Document Images Putting an Image on a Page Using Images as Links Putting an Image in the Background	Completed
February	Tables: Creating a Table, Table Headers and Captions Spanning Multiple Columns Styling Table Forms Basic Input and Attributes Other Kinds of Inputs Styling forms with CSS Where To Go From Here	Completed
March	PHP PROGRAMMING: Introduction to PHP, PHP introduction, inventions and versions, important tools and software requirements (like Web Server, Database, Editors etc.) PHP with other technologies, scope of PHP Basic Syntax, PHP variables and constants Types of data in PHP , Expressions, scopes of a variable (local, global) PHP Operators : Arithmetic, Assignment, Relational , Logical operators, Bitwise , ternary and MOD operator. PHP operator Precedence and associativity	Completed
April	PHP conditional events and Loops, PHP IF Else conditional statements (Nested IF and Else) Switch case, while ,For and Do While Loop, Goto , Break ,Continue and exit . PHP Functions: Function, Need of Function , declaration and calling of a function PHP Function with arguments, Default Arguments in Function, Function argument with call by value, call by reference Scope of Function Global and Local	Completed
May	String Manipulation and Regular Expression: Creating and accessing String, Searching & Replacing String Formatting, joining and splitting String, String Related Library functions Use and advantage of regular expression over inbuilt function Use of preg_match(), preg_replace(), preg_split() functions in regular expression Reference	Completed
June	Array: Anatomy of an Array, Creating index based and Associative array ,Accessing array Looping with Index based array, with associative array using each() and foreach() Some useful Library function	Completed

Session (2023-2026)**Semester- 1****PAPER: C-1Pprogramming Fundamentals using C/C++**

Month	Topics	Completed/Not Completed
January	<p>Introduction to C and C++: History of C and C++, Overview of Procedural Programming and Object-Orientation Programming, Using main() function, Compiling and Executing Simple Programs in C++.</p> <p>Data Types, Variables, Constants, Operators and Basic I/O Declaring, Defining and Initializing Variables, Scope of Variables, Using Named Constants, Keywords, Data Types, Casting of Data Types, Operators (Arithmetic, Logical and Bitwise), Using Comments in programs, Character I/O (getc, getchar, putc, putchar), Formatted and Console I/O (printf(), scanf(), cin, cout), Using Basic Header Files (stdio.h, iostream.h, conio.hetc).</p>	Completed
February	<p>Expressions, Conditional Statements and Iterative Statements: Simple Expressions in C++ (including Unary Operator Expressions, Binary Operator Expressions), Understanding Operators Precedence in Expressions, Conditional Statements (if construct, switch case construct), Understanding syntax and utility of Iterative Statements (while, do-while, and for loops), Use of break and continue in Loops, Using Nested Statements (Conditional as well as Iterative)</p> <p>Functions and Arrays: Utility of functions, Call by Value, Call by Reference, Functions returning value, Void functions, Inline Functions, Return data type of functions, Functions parameters, Differentiating between Declaration and Definition of Functions, Command Line Arguments/Parameters in Functions, Functions with variable number of Arguments.</p>	Completed
March	<p>Derived Data Types (Structures and Unions): Understanding utility of structures and unions, Declaring, initializing and using simple structures and unions, Manipulating individual members of structures and unions, Array of Structures, Individual data members as structures, Passing and returning structures from functions, Structure with union as members, Union with structures as members.</p> <p>Pointers and References in C++: Understanding a Pointer Variable, Simple use of Pointers (Declaring and Dereferencing Pointers to simple variables), Pointers to Pointers, Pointers to structures, Problems with Pointers, Passing pointers as function arguments, Returning a pointer from a function, using arrays as pointers, Passing arrays to functions. Pointers vs. References, Declaring and initializing references, Using references as function arguments and function return values</p>	Completed
April	<p>Memory Allocation in C++: Differentiating between static and dynamic memory allocation, use of malloc, calloc and free functions, use of new and delete operators, storage of variables in static and dynamic memory allocation</p> <p>File I/O, Preprocessor Directives Opening and closing a file (use of fstream header file, ifstream, ofstream and fstream classes), Reading and writing Text Files, Using put(), get(), read() and</p>	Completed

	write() functions, Random access in files, Understanding the Preprocessor Directives (#include, #define, #error, #if, #else, #elif, #endif, #ifdef, #ifndef and #undef), Macros	
May	<p>Using Classes in C++ Principles of Object-Oriented Programming, Defining & Using Classes, Class Constructors, Constructor Overloading, Function overloading in classes, Class Variables & Functions, Objects as parameters, Specifying the Protected and Private Access, Copy Constructors, Overview of Template classes and their use.</p> <p>Overview of Function Overloading and Operator Overloading: Need of Overloading functions and operators, Overloading functions by number and type of arguments, Looking at an operator as a function call, Overloading Operators (including assignment operators, unary operators)</p>	Completed
June	<p>Inheritance, Polymorphism and Exception Handling:</p> <p>Introduction to Inheritance (Multi-Level Inheritance, Multiple Inheritance), Polymorphism (Virtual Functions, Pure Virtual Functions), Basics Exceptional Handling (using catch and throw, multiple catch statements), Catching all exceptions, Restricting exceptions, Rethrowing exceptions.</p>	Completed

Faculty Member: Mr Bharat Bhushan

Session (2023-2026)

Semester- 1

PAPER: C-2(Computer System Architecture)

Month	Topics	Completed/Not Completed
January	Introduction: Logic gates, boolean algebra, combinational circuits, circuit simplification, flip-flops and sequential circuits, decoders, multiplexers, registers, counters and memory units.	Completed
February	Data Representation and Basic Computer Arithmetic: Number systems, complements, fixed and floating point representation, character representation, addition, subtraction, magnitude comparison, multiplication and division algorithms for integers	Completed
March	Basic Computer Organization and Design: Computer registers, bus system, instruction set, timing and control, instruction cycle, memory reference, input -output and interrupt, Interconnection Structures, Bus Interconnection design of basic computer	Completed
April	Central Processing: Register organization, arithmetic and logical micro-operations, stack organization, micro programmed control. Instruction formats, addressing modes, instruction codes, machine language, assembly language, input output programming, RISC, CISC architectures, pipelining and parallel architecture.	Completed
May	Input-Output Organization: Input / Output: External Devices, I/O Modules, Programmed I/O, Interrupt-Driven I/O, Direct Memory Access, I/O Channels.	Completed
June	Memory Organization: Cache memory, Associative memory, mapping.	Completed

Session (2023-2026)

Semester- II

PAPER: C-3(Programming in JAVA)

Month	Topics	Completed/Not Completed
January	Introduction to Java: Java Architecture and Features. Understanding the semantic and syntax differences between C++ and Java. Compiling and Executing a Java Program, Variables, Constants, Keywords Data Types, Operators (Arithmetic, Logical and Bitwise) and Expressions, Comments, Doing Basic Program Output, Decision Making Constructs (conditional statements and loops) and Nesting, Java Methods (Defining, Scope, Passing and Returning Arguments, Type Conversion and Type and Checking, Built in Java Class Methods).	Completed
February	Arrays, Strings and I/O: Creating & Using Arrays (One Dimension and Multi-dimensional), Referencing Arrays Dynamically, Java Strings: The Java String class, Creating & Using String Objects, Manipulating Strings, String Immutability & Equality, Passing Strings To & From Methods, String Buffer Classes. Simple I/O using System.out and the Scanner class, Byte and Character streams, Reading/Writing from console and files	Completed
March	Object-Oriented Programming Overview: Principles of Object-Oriented Programming, Defining & Using Classes, Controlling Access to Class Members, Class Constructors, Method Overloading, Class Variables & Methods, Objects as parameters, final classes, Object class, Garbage Collection.	Completed
April	Inheritance, Interfaces, Packages, Enumerations, Autoboxing and Metadata: Inheritance: (Single Level and Multilevel, Method Overriding, Dynamic Method Dispatch, Abstract Classes), Interfaces and Packages, Extending interfaces and packages, Package and Class Visibility, Using Standard Java Packages (util, lang, io, net), Wrapper Classes, Autoboxing/Unboxing, Enumerations and Metadata.	Completed
May	Exception Handling, Threading, Networking and Database Connectivity: Exception types, uncaught exceptions, throw, built-in exceptions, Creating your own exceptions; Multi-threading: The Thread class and Runnable interface, creating single and multiple threads, Thread prioritization, synchronization and communication, suspending/resuming threads. Using java.net package, Overview of TCP/IP and Datagram programming. Accessing and manipulating databases using JDBC. Applets and Event Handling: Java Applets: Introduction to Applets, Writing Java Applets, Working with Graphics, Incorporating Images & Sounds. Event Handling Mechanisms, Listener Interfaces, Adapter and Inner Classes	Completed
June	The design and Implementation of GUIs using the AWT controls, Swing components of Java Foundation Classes such as labels, buttons, text fields, layout managers, menus, events and listeners; Graphic objects for drawing figures such as lines, rectangles, ovals, using different fonts. Overview of servlets.	Completed

Faculty Member: Mr. Bharat Bhushan

Session (2023-2026)

Semester- II

PAPER: C-4(DISCRETE STRUCTURES THEORY)

Month	Topics	Completed/Not Completed
January	Introduction: Introduction sets ,operations on sets ,basic operations , pprpperties common to logic and sets , Relations and cartesian product, relations and their types , property of relations ,Functions ,operations on functions	Completed
February	Growth of Functions: Asymptotic Notations, Summation formulas and properties, Bounding Summations, approximation by Integrals	Completed
March	Recurrences: Recurrence Relations, generating functions, Linear Recurrence Relations with constant coefficients and their solution, Substitution Method, Recurrence Trees, Master Theore	Completed
April	Graph Theory: Basic Terminology, Models and Types, multigraphs and weighted graphs, Graph Representaion, Graph Isomorphism, Connectivity, Euler and Hamiltonian Paths and Circuits, Planar Graphs,	Completed
May	Graph Coloring, Trees, Basic Terminology and properties of Trees, Introduction to Spanning Trees Propositional Logic: Logical Connectives,	Completed
June	Well-formed Formulas, Tautologies, Equivalences	Completed