**Lesson Plan**

**Class – BCA 1st Sem + BSc 1st Sem Faculty – Mr. Amit Rathee**

**Subject –Computer Fundamentals & C Programming Paper Code- 23BCA401DS02**

**Lesson Plan Duration - From July 2025 to November 2025**

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| **Time Period** | **Topics** | **Reference** |
| **July- Week 3** | Generations of Computers, Block Diagram along with its components, classification of computers, Applications of computers in various fields. | 1. Yashwant Kanetker: Let us C, BPB. 2. C Programming by Sushil Goel |
| **July- Week 4** | Input/ Output Devices, Memory: Concept of primary & secondary memory, Cache Memory, Secondary storage devices. |
| **July- Week 5** | Introduction to computer networking, Network types, Network topologies, Internet and its applications; Operating system and its functions. |
| **August- Week 2** | Revision & Test/ Presentation |
| **August- Week 3** | Problem definition, Program design, Debugging, Types of errors in  programming, Techniques of Problem Solving- Flowcharting, Algorithms |
| **August- Week 4** | History of C, Importance of C, Elements of C: C character set, identifiers and keywords, Data types, Constants and Variables, Assignment statement |
| **August- Week 5** | Symbolic constant, Structure of a C Program, printf(), scanf() Functions, Operators & Expression, type casting and conversion, operator hierarchy & associativity |
| **September- Week 1** | Revision & Test/ Presentation |
| **September- Week 2** | Decision making with IF statement, IF-ELSE statement, Nested IF statement, ELSE-IF ladder, switch statement, goto statement. |
| **September- Week 3** | while, do-while and for loop, jumps in loops, break, continue statement, Nested loops |
| **September- Week 4** | Revision & Test/ Presentation |
| **October- Week 1** | Standard Mathematical functions, Input/output: Unformatted & formatted I/O function in C, Input functions output functions |
| **October- Week 2** | String manipulation functions. User defined functions: Introduction/Definition, function prototype, Local and global variables, passing parameters, recursion. |
| **October- Week 4** | Definition, types, initialization, processing an array, passing arrays to functions, Declaration and initialization of string, Input/output of string data, Introduction to pointers. |
| **November- Week 2** | Revision & Test/ Presentation |
| **November- Week 3** | Revision & Test/ Presentation |

(Teacher’s Signature)

**Lesson Plan**

**Class – B.Sc 3rd Sem Faculty – Mr. Amit Rathee**

**Subject –Data Structure & Algorithm Paper Code-**

**Lesson Plan Duration - From July 2025 to November 2025**

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| **Time Period** | **Topics** | **Reference** |
| **July- Week 3** |  |  |
| **July- Week 4** |  |
| **July- Week 5** |  |
| **August- Week 2** | Revision & Test/ Presentation |
| **August- Week 3** |  |
| **August- Week 4** |  |
| **August- Week 5** |  |
| **September- Week 1** | Revision & Test/ Presentation |
| **September- Week 2** |  |
| **September- Week 3** |  |
| **September- Week 4** |  |
| **October- Week 1** | Revision & Test/ Presentation |
| **October- Week 2** |  |
| **October- Week 4** |  |
| **November- Week 2** |  |
| **November- Week 3** | Revision & Test/ Presentation |

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**Lesson Plan**

**Class – BCA 3rd Sem + B.Sc 3rd Sem Faculty – Mr. Amit Rathee**

**Subject –Object-Oriented Programming using C++ Paper Code- 24BCA403DS02**

**Lesson Plan Duration - From July 2025 to November 2025**

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| **Time Period** | **Topics** | **Reference** |
| **July- Week 3** | Procedural Vs. Object- Oriented Programming, Principles of OOP and their benefits. | 1. Bala Guruswamy : Object Oriented Programming and C++, THM 2. Object Oriented Programming by Sushil Goel |
| **July- Week 4** | Object, classes, Inheritance, Abstraction, Encapsulation Polymorphism, Dynamic Binding, and Message passing. |
| **July- Week 5** | Syntax and structure of C++ programs, Data types, variables, and constants in C++, Control structures: decision making and looping constructs |
| **August- Week 2** | Revision & Test/ Presentation |
| **August- Week 3** | Defining and using classes and objects, Member functions and data members, Access specifiers: public, private, protected, |
| **August- Week 4** | Functions and parameter passing in C++, Arrays and strings in C++,  Pointer, Constructors and destructors. |
| **August- Week 5** | Derived class and Base class, Types of inheritance: single, multiple, multilevel, hierarchical, Access control in inheritance. |
| **September- Week 1** | Revision & Test/ Presentation |
| **September- Week 2** | function overloading, Operator overloading, Virtual functions and dynamic polymorphism, |
| **September- Week 3** | Abstract classes and pure virtual functions, Encapsulation and data hiding, Friend functions, static function. |
| **September- Week 4** | Dynamic Memory Allocation: new, delete, Object Creation at run time. |
| **October- Week 1** | Revision & Test/ Presentation |
| **October- Week 2** | Throwing, Catching, Re-throwing an exception, specifying exception: processing unexpected exceptions; try-catch blocks, Exception propagation, |
| **October- Week 4** | Stream Classes, File input and output Operations in C++, Error handling during file operations. |
| **November- Week 2** | Templates: class and function templates,  Standard Template Library: benefits of STL and generic programming |
| **November- Week 3** | Revision & Test/ Presentation |

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**Lesson Plan**

**Class – BCA 3rd Sem Faculty – Mr. Amit Rathee**

**Subject –Operating Systems Paper Code- 24BCA403DS01**

**Lesson Plan Duration - From July 2025 to November 2025**

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| **Time Period** | **Topics** | **Reference** |
| **July- Week 3** | Objectives and Characteristics. Classification: Batch, Multi-  Programming, Multi-processing, Multi-tasking, Time-sharing, Distributed, Network and Real time Operating systems. | 1. Silberschatz & Galvin: Operating System Concept, Wiley. 2. Operating System by Sushil Goel |
| **July- Week 4** | System Calls and Services. Operating System Functions- Process management, Memory management, Secondary storage management, I/O management, File management, Protection and Security. |
| **July- Week 5** | Structures- Simple Structure, Monolithic structure, Layered approach, Microkernel, Exokernel and Virtual Machines. |
| **August- Week 2** | Revision & Test/ Presentation |
| **August- Week 3** | Process concept- Process State Model, Process Control Block and  Threads. Process Scheduling- Scheduling Queues, Schedulers and Context Switch. |
| **August- Week 4** | Operations on Processes, Cooperating processes and Inter-Process Communication. Scheduling Criteria, Scheduling Algorithms: Single Processor Scheduling: FCFS, SJF, Round Robin, Multi Feedback Queue. |
| **August- Week 5** | Multiple Processor Scheduling and Real Time scheduling. Scheduling  Algorithm Evaluation. |
| **September- Week 1** | Revision & Test/ Presentation |
| **September- Week 2** | Concepts of Memory Management, Logical and Physical address space, Swapping, Memory allocation: Contiguous and Non-Contiguous. |
| **September- Week 3** | Paging: Hardware Support. Page Map Table and  Protection. Segmentation: Hardware Support and Protection and Sharing. |
| **September- Week 4** | Need of Virtual Memory, Demand paging, Pure Demand Paging. Handling page faults, Performance of Demand Paging. Page replacement Algorithms and Allocation of Frames: Allocation algorithms and Global vs Local Allocation. Thrashing. |
| **October- Week 1** | Revision & Test/ Presentation |
| **October- Week 2** | Basic I/O Devices, Types of I/O Devices: Block and Character Devices. I/O Software: Device Independent I/O, User Space I/O and Kernel I/O Software. |
| **October- Week 4** | Device Controllers, Device Drivers and Interrupt Handlers. Communication Approaches to I/O Devices: Special Instruction I/O, Memory Mapped I/O  and Direct Memory Access (DMA). Secondary Storage Structure: Disk Structure and Disk Scheduling Algorithms. |
| **November- Week 2** | File Concept: Attributes, Operations and Types. File Access Methods: Sequential Access, Direct Access and Indexed Sequential. Free Space Management. Directory Structures: Single Level,  Two level and Tree Structured. File Protection and Sharing. |
| **November- Week 3** | Revision & Test/ Presentation |

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**Lesson Plan**

**Class – BCA 5th Sem Faculty – Mr. Amit Rathee**

**Subject –Computer Graphics Paper Code- BCA-302**

**Lesson Plan Duration - From July 2025 to November 2025**

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| **Time Period** | **Topics** | **Reference** |
| **July- Week 3** | Introduction to computer graphics, Basics of Graphics systems, Application areas of Computer Graphics, overview of graphics systems | 1. Computer Graphics by Suman Wadhwa 2. Computer Graphics by Sushil Goel |
| **July- Week 4** | Video-display devices, and raster-scan systems, random scan systems, graphics monitors and workstations and input devices. Points and lines, line drawing algorithms |
| **July- Week 5** | Mid-point circle and ellipse algorithms. Filled area primitives: Scan line polygon fill algorithm, boundary fill and floodfill algorithms |
| **August- Week 2** | Revision & Test/ Presentation |
| **August- Week 3** | 2-D Geometrical Transforms: Translation, scaling, rotation, reflection and shear transformations, matrix representations and homogeneous coordinates, composite transforms, transformations between coordinate systems |
| **August- Week 4** | 2-D Viewing: The viewing pipeline, viewing coordinate reference frame, window to viewport coordinate transformation, viewing functions |
| **August- Week 5** | Cohen-Sutherland and Cyrus-beck line  clipping algorithms, Sutherland –Hodgeman polygon clipping algorithm |
| **September- Week 1** | Revision & Test/ Presentation |
| **September- Week 2** | Polygon surfaces, quadric surfaces, spline representation, Hermite curve |
| **September- Week 3** | Bezier curve and B-Spline curves, Bezier and B-Spline surfaces |
| **September- Week 4** | Basic illumination models, polygon-rendering methods |
| **October- Week 1** | Revision & Test/ Presentation |
| **October- Week 2** | 3-D Geometric Transformations: Translation, rotation, scaling, reflection and shear transformations, composite transformations |
| **October- Week 4** | 3-D Viewing: Viewing pipeline, viewing coordinates, view volume and general projection transforms and clipping |
| **November- Week 2** | Revision & Test/ Presentation |
| **November- Week 3** | Revision & Test/ Presentation |

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**Lesson Plan**

**Class – BCA 5th Sem Faculty – Mr. Amit Rathee**

**Subject –Data Communication and Networking Paper Code- BCA-303**

**Lesson Plan Duration - From July 2025 to November 2025**

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| **Time Period** | **Topics** | **Reference** |
| **July- Week 3** | Introduction to Computer Communications and Networking Technologies; Uses of Computer Networks; Types of Computer Networks  and their Topologies; Network Design issues and Protocols; | 1. Behrouz A Forouzan, “Data Communications and Networking”, McGraw Hill. 2. Computer Networks and Communication by Sushil Goel |
| **July- Week 4** | Connection-Oriented and Connectionless Services; Network Applications and Application Protocols; Computer Communications and Networking Models: Decentralized and Centralized Systems, Distributed Systems, Client/Server Model, Peer-to-Peer Model, Web Based Model |
| **July- Week 5** | Network Architecture and the OSI Reference Model, TCP/IP reference model, Example Networks: The Internet, X.25, Frame Relay, ATM. |
| **August- Week 2** | Revision & Test/ Presentation |
| **August- Week 3** | Analog and Digital Communications Concepts: Concept of data, signal, channel, bid-rate, maximum data-rate of channel, Representing Data as Analog Signals, Representing Data as Digital Signals |
| **August- Week 4** | Data Rate and Bandwidth, Capacity, Baud Rate; Asynchronous and synchronous transmission, data encoding techniques, Modulation techniques, Digital Carrier Systems; Guided and Wireless Transmission Media; Communication Satellites |
| **August- Week 5** | Switching and Multiplexing; Dialup Networking; Analog Modem Concepts; DSL Service |
| **September- Week 1** | Revision & Test/ Presentation |
| **September- Week 2** | Data Link Layer: Framing, Flow Control, Error Control; Error Detection and Correction; Sliding Window Protocols; Media Access Control: Random Access Protocols, Token Passing Protocols; |
| **September- Week 3** | Token Ring; Introduction to LAN technologies: Ethernet, switched Ethernet, VLAN, fast Ethernet, gigabit Ethernet, token ring, FDDI, Wireless LANs; Bluetooth; |
| **September- Week 4** | Network Hardware Components: Connectors, Transceivers, Repeaters, Hubs, Network Interface Cards and PC Cards, Bridges, Switches, Routers, Gateways |
| **October- Week 1** | Revision & Test/ Presentation |
| **October- Week 2** | Network Layer and Routing Concepts: Virtual Circuits and Datagrams |
| **October- Week 4** | Routing Algorithms: Flooding, Shortest Path Routing, Distance Vector Routing; Link State Routing, Hierarchical Routing; Congestion Control Algorithms; Internetworking; |
| **November- Week 2** | Network Security Issues: Security threats; Encryption Methods; Authentication; Symmetric – Key Algorithms; Public-Key Algorithms. |
| **November- Week 3** | Revision & Test/ Presentation |

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