**Lesson Plan**

**Class- B.Sc 6th Sem. Subject- Visual Basic Programming**

**Faculty- Mr. Amit Rathee Paper Code- 6.1**

**Duration- From January 2025 to May 2025**

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| **Time Period** | **Topics Covered** |
| January | Week-1 | Introduction to VB: Visual & Non-visual programming, Procedural |
| Week-2 | Object-oriented and event- driven programming languages, The VB environment: Menu bar, Toolbar, Immediate window.  |
| Week-3 | Project explorer, Toolbox, Properties window, Form designer, Form layout. Event driven programming |
| Week-4 | **Test/ Revision/ Assignment** |
| February | Week-1 | Basics of Programming: Variables: Declaration, Types of variables, Converting variables types |
| Week-2 | User defined data types, Scope & lifetime of variables |
| Week-3 | Constants: Named & intrinsic. Operators: Arithmetic, Relational & Logical operators |
| Week-4 | I/O in VB: Various controls for I/O in VB, Message box, Input Box, Print statement |
| March | Week-1 | **Test/ Revision/ Assignment** |
| Week-2 | Programming with VB: Decisions and conditions: If statement, If-then-else, Select-case |
| Week-3 | Looping statements: Do-loops, For-next, While-wend, Exit statement. Nested control structures |
| April | Week-1 | Arrays: Declaring and using arrays, one-dimensional and multi-dimensional arrays, Static & dynamic arrays, Arrays of array |
| Week-2 | **Test/ Revision/ Assignment** |
| Week-3 | Programming with VB: Procedures: General & event procedures, Subroutines, Functions, Calling procedures, Arguments- passing mechanisms, Optional arguments, Named arguments |
| Week-4 | Functions returning custom data types. Working with forms: Adding multiple forms in VB, Hiding & showing forms, Load & unload statements, Activate & deactivate events |
| Week-5 | Form-load event, menu designing in VB, Database Programming using DAO & ADO, Simple Active X controls |
| May | Week-1 | **Test/ Revision/ Assignment** |

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**Lesson Plan**

**Class- B.Sc 6th Sem. Subject- Software Engineering**

**Faculty- Mr. Amit Rathee Paper Code- 6.2**

**Duration- From January 2025 to May 2025**

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| **Time Period** | **Topics Covered** |
| January | Week-1 | Software and software engineering: Software characteristics, Software Processes, software crisis |
| Week-2 | Software life cycle models, Waterfall, Prototype, Evolutionary and Spiral Models |
| Week-3 | software engineering paradigms, goals and principles of software engineering |
| Week-4 | **Test/ Revision/ Assignment** |
| February | Week-1 | Software requirement analysis – Structured analysis, object-oriented analysis and data modeling |
| Week-2 | software requirement specification, validation, Software requirements Analysis and Specifications: Requirement engineering, requirements analysis using DFD |
| Week-3 | Data Dictionaries and E-R Diagram, requirement documentation, nature of SRS, characteristics and organization of SRS |
| Week-4 | **Test/ Revision/ Assignment** |
| March | Week-1 | Software project management: Planning a software project, Software cost estimation |
| Week-2 | project scheduling, personnel planning, team structure, Software configuration management |
| Week-3 | software quality and quality assurance, project monitoring, risk management |
| April | Week-1 | **Test/ Revision/ Assignment** |
| Week-2 | Design and implementation of software- Software design fundamentals, software design principles |
| Week-3 | Cohesion and Coupling, Classification of Cohesion and Coupling, Function oriented design |
| Week-4 | Object-oriented Design, design verification, monitoring and control |
| Week-5 | **Test/ Revision/ Assignment** |
| May | Week-1 | **Test/ Revision/ Assignment** |

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**Lesson Plan**

**Class- B.Sc 4th Sem. Subject- Operating System**

**Faculty- Mr. Amit Rathee Paper Code- 4.2**

**Duration- From January 2025 to May 2025**

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| **Time Period** | **Topics Covered** |
| January | Week-1 | Introductory Concepts: Operating system functions and characteristics, historical evolution of operating systems |
| Week-2 | types of Operating System: Real time, Multiprogramming, Multiprocessing, Batch processing |
| Week-3 | Methodologies for implementation of O/S service system calls, system programs |
| Week-4 | **Test/ Revision/ Assignment** |
| February | Week-1 | Process management: Process concepts, operations on processes, Process states and Process Control Block |
| Week-2 | CPU Scheduling: Scheduling criteria, Levels of Scheduling, Scheduling algorithms, Multiple processor scheduling |
| Week-3 | Deadlocks: Deadlock characterization, Deadlock prevention and avoidance |
| Week-4 | **Test/ Revision/ Assignment** |
| March | Week-1 | Concurrent Processes: Critical section problem, Semaphores, Classical process co-ordination problems and their solutions |
| Week-2 | Inter-process Communications. Storage Management : memory management of single-user and multi-user operating system |
| Week-3 |  partitioning, swapping, paging and segmentation, Thrashing |
| April | Week-1 | **Test/ Revision/ Assignment** |
| Week-2 | File management: File Systems: Functions of the system, File access methods |
| Week-3 | allocation methods: Contiguous, allocation, linked, indexed allocation |
| Week-4 | Directory Systems: Structured Organizations, directory and file protection mechanisms |
| Week-5 | **Test/ Revision/ Assignment** |
| May | Week-1 | **Test/ Revision/ Assignment** |

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**Lesson Plan**

**Class- BCA 4th Sem. Subject- Software Engineering**

**Faculty- Mr. Amit Rathee Paper Code- BCA-209**

**Duration- From January 2025 to May 2025**

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| **Time Period** | **Topics Covered** |
| January | Week-1 | Software Crisis, Software Processes & Characteristics, Software life cycle models, Waterfall, Prototype, Evolutionary and Spiral Models |
| Week-2 | Requirement engineering, requirement elicitation techniques like FAST, QFD, requirements analysis using DFD |
| Week-3 | Data dictionaries & ER Diagrams, Requirements documentation, Nature of SRS, Characteristics & organization of SRS |
| Week-4 | **Test/ Revision/ Assignment** |
| February | Week-1 | The Management spectrum, The People The Problem, The Process, The Project |
| Week-2 | Size Estimation like lines of Code & Function Count, Cost Estimation Models, COCOMO, Risk Management |
| Week-3 | **Test/ Revision/ Assignment** |
| Week-4 | Cohesion & Coupling, Classification of Cohesiveness & Coupling, Function Oriented Design |
| March | Week-1 | Object Oriented Design, Software Metrics: Software measurements: What & Why, Token Count, Halstead Software Science Measures, Design Metrics, Data Structure Metrics |
| Week-2 | Relationship between design and implementation, Implementation issues and programming support environment, Coding the procedural design, Good coding style |
| Week-3 | **Test/ Revision/ Assignment** |
| April | Week-1 | Testing Process, Design of Test Cases, Types of Testing |
| Week-2 | Functional Testing, Structural Testing, Test Activities, Unit Testing, Integration Testing and System Testing, Debugging Activities |
| Week-3 | Management of Maintenance, Maintenance Process, Reverse Engineering |
| Week-4 | Software Re-engineering, Configuration Management, Documentation |
| Week-5 | **Test/ Revision/ Assignment** |
| May | Week-1 | **Test/ Revision/ Assignment** |

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**Lesson Plan**

**Class- BCA 4th Sem. Subject- Data Structure-II**

**Faculty- Mr. Amit Rathee Paper Code- BCA-207**

**Duration- From January 2025 to May 2025**

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| **Time Period** | **Topics Covered** |
| January | Week-1 | Tree: Header nodes, Threads, Binary search trees, Searching, Insertion and deletion in a Binary search tree |
| Week-2 | AVL search trees, Insertion and deletion in AVL search tree, m-way search tree |
| Week-3 | Searching, Insertion and deletion in an m-way search tree, B-trees |
| Week-4 | Searching, Insertion and deletion in a B-tree, B+ tree, Huffman’s algorithm, General trees |
| February | Week-1 | **Test/ Revision/ Assignment** |
| Week-2 | Graphs: Warshall’s algorithm for shortest path, Dijkstra algorithm for shortest path |
| Week-3 | Operations on graphs, Traversal of graph, Topological sorting |
| Week-4 | **Test/ Revision/ Assignment** |
| March | Week-1 | Sorting: Internal & external sorting, Radix sort, Quick sort, Heap sort, Merge sort |
| Week-2 | Tournament sort, Searching: Liner search, binary search, merging |
| Week-3 | Comparison of various sorting and searching algorithms on the basis of their complexity |
| April | Week-1 | **Test/ Revision/ Assignment** |
| Week-2 | Files: Physical storage devices and their characteristics, Attributes of a file viz fields, records, Fixed and variable length records |
| Week-3 | Primary and secondary keys, Classification of files, File operations, Comparison of various types of files |
| Week-4 | File organization: Serial, Sequential, Indexed-sequential, Random-access/Direct, Inverted, Multi-list file organization |
| Week-5 | Hashing: Introduction, Hashing functions and Collision resolution methods |
| May | Week-1 | **Test/ Revision/ Assignment** |

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**Lesson Plan**

**Class- BCA 2nd Sem. Subject- Digital Logic Design**

**Faculty- Mr. Amit Rathee Paper Code- 23BCA402DS01**

**Duration- From January 2025 to May 2025**

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| **Time Period** | **Topics Covered** |
| February | Week-1 | Digital Systems: Digital Signals, Digital Waveforms, Digital Computers and Digital Integrated Circuits |
| Week-2 | Binary Number Systems, Octal and Hexadecimal Number System. Number Base Conversions. Complements, Signed Binary Numbers and Binary Codes, Error Detection and Correction codes |
| Week-3 | Axiomatic Definition, Theorems and Properties. Boolean Functions, Canonical Standard forms: SOP and POS forms |
| Week-4 | Digital Logic Gates: NOT, OR, AND, NOR, NAND, XOR and XNOR. Universal Gates and their implementation |
| March | Week-1 | **Test/ Revision/ Assignment** |
| Week-2 | Karnaugh Map (K-map) Method: Simplification: Algebra postulates and Canonical forms |
| Week-3 | Prime Implicants: Types, Determination and Selection of Prime implicants. Don’t Care Conditions, NAND and NOR implementation |
| April | Week-1 | **Test/ Revision/ Assignment** |
| Week-2 | Introduction, Characteristics and Designing principles of Combinational circuits |
| Week-3 | Binary Adder: Half-Adder & Full-Adder, Subtractor: Half-Subtractor & Full-Subtractor, Parallel binary Adder/Subtractor |
| Week-4 | Binary Multiplier, Comparators, Multiplexers, De-multiplexers, Encoders and Decoders |
| Week-5 | **Test/ Revision/ Assignment** |
| May | Week-1 | Sequential Circuits: Characteristics of Sequential Circuits, Latches |
| Week-2 | Flip-Flops: Introduction, S-R Flip flop, J-K Flip Flop, D Flip flop, T Flip flop and Master Slave Flip flop |
| Week-3 | Registers: Shift Registers, Applications of Registers |
| Week-4 | Counters: Asynchronous & Synchronous Counters. Modulo-N Counters and Up-Down Counters |
| Week-5 | **Test/ Revision/ Assignment** |

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**Lesson Plan**

**Class- B.Sc 2nd Sem. Subject- Object Oriented Programming using C++**

**Faculty- Mr. Amit Rathee Paper Code- 24CSCM402DS01**

**Duration- From January 2025 to May 2025**

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| **Time Period** | **Topics Covered** |
| February | Week-1 | Paradigms of Programming Languages, Evolution of OO Methodology, Basic concepts of Object-Oriented (OO) methodology, Comparison with procedural programming |
| Week-2 | Characteristics of Object-Oriented programming, Advantages, disadvantages and applications of OOPS |
| Week-3 | Data Types, Variables, Operators, Expressions, Structure of a C++ program, Creating the source files, Compiling and linking programs |
| Week-4 | Creating classes and Objects, Arrays, Strings, Structure, Recursion, and Control Statements |
| March | Week-1 | **Test/ Revision/ Assignment** |
| Week-2 | Defining and using classes and objects, Member functions and data members, Access specifiers: public, private, protected |
| Week-3 | Functions and parameter passing in C++, Arrays and strings in C++, Pointer, Constructors and destructors |
| April | Week-1 | Inheritance: Derived class and Base class, Types of inheritance: single, multiple, multilevel, hierarchical, Access control in inheritance |
| Week-2 | **Test/ Revision/ Assignment** |
| Week-3 | Definition, Function overloading, Operator overloading, Virtual functions and dynamic polymorphism |
| Week-4 | Abstract classes and pure virtual functions, Encapsulation and data hiding, Friend function, Static function |
| Week-5 | Memory Management: Dynamic Memory Allocation: new, delete, Object Creation at run time |
| May | Week-1 | **Test/ Revision/ Assignment** |
| Week-2 | Exception handling: Throwing, Catching, Re-throwing an exception, specifying exception: processing unexpected exceptions; try-catch blocks, Exception propagation |
| Week-3 | Templates: Class and Function templates, Standard Template Library (STL): Benefits of STL and Generic programming |
| Week-4 | **Test/ Revision/ Assignment** |
| Week-5 | **Test/ Revision/ Assignment** |

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