**LESSON PLAN**

**BCA III**

**OPERATING SYSTEM**

**SEPTEMBER**

Operating System: Definition, Characteristics, Components, Functions, Examples; Types of Operating System: Single User/Multi User, Classification of Operating System: Batch, Multiprogrammed, Timesharing, Multiprocessing, Parallel, Distributed, Real Time; System Calls and System Programs: Process Control, File Manipulation, Device Manipulation, Information Maintenance, Communications.

**OCTOBER**

Process Management: Process concept, Process states and Process Control Block; Process Scheduling: Scheduling Queues, Schedulers, Context Switch; Operation on Processes: Process Creation, Process Termination; Cooperating Processes, Introduction to Threads, Inter-process Communication; CPUScheduling: Basic Concepts, Scheduling Criteria, Scheduling Algorithms: FCFS, SJF, Priority, Round-Robin, Multilevel Queue, Multilevel Feedback Queue Scheduling

**NOVEMBER**

Deadlocks: System Model, Deadlock Characterization, Methods of Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection and Recovery Memory Management: Introduction, Swapping, Contiguous Allocation: Single-Partition/Multiple Partition Allocation, External/Internal Fragmentation; Paging: Basic Method, Hardware, Implementation of Page table; Segmentation: Basic Method, Hardware, Implementation of Segment Table, Advantages/Disadvantages of Paging/Segmentation

**DECEMBER**

Virtual Memory: Introduction, Demand Paging, Page Replacement, Page Replacement Algorithms: FIFO, Optimal, LRU, Counting; Thrashing and its cause; File Management: File Concepts, File Attributes, File Operations, File Types, File Access/Allocation Methods, File Protection, File Recovery.

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**LESSON PLAN**

**BCA III**

**MULTIMEDIA**

**SEPTEMBER**

Multimedia: Basic Concept, Definition, Components & Applications of Multimedia; Hypermedia and Multimedia; Multimedia Hardware and Software; Multimedia Software Tools; Presentation Tools; Multimedia Authoring: Introduction, Features, Types of Authoring Tools: Card or Page-Based, Icon- Based, Time-Based, Object-Oriented; VRML: History, Features

**OCTOBER**

Images: Graphics/Image Data Types, File Formats; Color Models in Images and Video; Video: Introduction, Types of Video Signals; Analog and Digital Video; Analog Video Standards: NTSC, PAL, SECA; Digital Video Standards: Chroma Subsampling, CCIR Standards, HDTV

**NOVEMBER**

Digital Audio: Basic Concepts, Analog vs. Digital Audio, Digitization of Sound; Digital Audio File Formats, MIDI Quantization and Transmission of Audio: Coding of Audio; Pulse Code Modulation; Differential Coding of Audio; Lossless Predictive Coding; DPCM; DM; ADPCM

**DECEMBER**

Compression Techniques: Introduction, Types of Data Compression, Run-Length Coding, Variable- Length Coding, Dictionary-Based Coding, Transform Coding Image and Video Compression Techniques: JPEG Standard for Image Compression; JPEG Mode, Video Compression Techniques: H.261, H.263, MPEG

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**LESSON PLAN**

**BCA II**

**COMPUTER ARCHITECTURE**

**SEPTEMBER**

Basic Computer Organisation and Design: Instruction Codes, Computer registers, Computer Instructions, Timing and Control, Instruction Cycle, Memory reference instructions, Input-Output and Interrupt, Design of Basic computer, Design of accumulator logic

**OCTOBER**

Register Transfer and Microoperations: Register Transfer Language (RTL), register transfer, Bus and Memory Transfers, Arithmetic Microoperations, Logic Microoperations, Shift Microoperations, Arithmetic Logic Shift Unit, Microprogrammed Control: Control memory; address sequencing, microprogram sequencer, Design of Control Unit

**NOVEMBER**

Central Processing Unit: General registers Organization, Stack Organization, Instruction formats, Addressing Modes, Data Transfer and Manipulation, Program Control, Program Interrupt, RISC, CISC. Memory Organization: Memory hierarchy, Auxiliary Memory, Associative Memory, Interleaved memory, Cache memory, Virtual Memory, Memory Management Hardware,

**DECEMBER**

Input Output Organization : Peripheral devices , Input-Output Interface, Asynchronous data transfer, Modes of Transfer, Priority Interrupt, Direct Memory Access(DMA),Input-Output Processor(IOP).

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**LESSON PLAN**

**BCA I & B.SC I(CS)**

**BCA – 111 Computer and Programming Fundamentals**

**SEPTEMBER**

Computer Fundamentals: Definition, Block Diagram along with its components, characteristics & classification of computers, Applications of computers in various fields. Memory: Concept of primary & secondary memory, RAM, ROM, types of ROM, flash memory, Secondary storage devices: Sequential & direct access devices viz. magnetic tape, magnetic disk, CD, DVD.

**OCTOBER**

Computer hardware & software: I/O devices, relationship between hardware and software, types of software, Operating system: Definition, functions of operating system, concept of multiprogramming, multitasking, multithreading, multiprocessing, time-sharing, real time, single-user & multi-user operating system.

**NOVEMBER**

Planning the Computer Program: Concept of problem solving, Problem definition, Program design, Debugging, Types of errors in programming, Documentation, Techniques of Problem Solving: Flowcharting, algorithms, pseudo code, decision table, Structured programming concepts, Programming methodologies viz. top-down and bottom-up programming. Computer Virus, WORMS, Trojan,

**DECEMBER**

Searching, Sorting, and Merging: Linear & Binary Searching, Bubble, Selection, and Insertion Sorting, Merging, Design of algorithms for searching, sorting and merging. Computer Languages: Analogy with natural language, machine language, assembly language, high-level language, language translators, characteristics of a good programming language.

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**LESSON PLAN**

**PGDCA**

**CS-DE-14 DATA BASE MANAGEMENT SYSTEMS**

**OCTOBER**

Data, Information and Knowledge – Limitations of Manual Data Processing – Advantages of databases- Basic DBMS Terminology – Role of DBA, Data Manager, File Manager and Disk Manager- Three Level Architecture of DBMS- Physical and Logical Data Independence,

**NOVEMBER**

Data Base languages and Interfaces, DBMS functions and component modules.

Entity Relationship Model- Concepts, Relationships, Constraints, Keys- Primary, Secondary, Composite ,Foreign Key etc. E-R Diagrams, Mapping ER- diagrams to Relational Tables, Case studies: Inventory System, Payroll System, Reservation System, Online Book Store etc.

**DECEMBER**

Introduction to Data Models, Comparison between Hierarchical, Network and Relational models. Relational Algebra- Query Language, Basic Set Operations, Special Relational Operations.

**JANUARY**

Introduction to SQL: DDL, DML, and DCL Commands. Views Queries in SQL, Specifying Constraints

**FEBRUARY**

 Indexes in SQL. Functional Dependencies, Normalization- Normal forms based on primary keys (1 NF, 2 NF, 3 NF, &amp; BCNF)

**MARCH**

MS Access: Parts of an Access Window, Tool Bars and Their Icons, Creating a New Database, Creating a Database through Table Wizard, Creating a New Table, Relationships,

**APRIL**

Creating Table through Design View, Relationship, Query, Forms, Reports, Import/export tables etc.

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