Dr. Vijaya Shridhar

LESSON PLAN 2025-26

BCA 2ND YEAR

Database Management System

July & August Unit-1

Database Management System: Introduction, Database System Applications, History of Database Systems, Database System Vs. File Processing System, View of Data, Data Abstraction, Instances and Schemas. DBMS Environment, Database languages, Database Models.

Database design and ER Model: Physical, Conceptual and Logical Database design, Entity- Relationship

Model: Entities, Relationships, Representation of entities, attributes, Representation of relationship set, Generalization, Aggregation, Conceptual design with ER Model

Sept & October

Unit-II

Relational Model: Introduction to the Relational Model, Attributes, Domains, Tuples, Relations and their schemes, relation representation, Keys, relationship, relational operations, Integrity Constraint Over relations, Enforcing Integrity constraints, Querying relational data, View: Introduction to Views, Destroying/altering Views.

Relational Algebra and Calculus: Relational Algebra & its operations, Relational calculus & its types, Power of Algebra and calculus.

Lab Problem(s): Creation and Querying relational data with SQL

Storage and File Organization: Overview of physical storage media, Storage access; File organization,

Operations on Files, Serial Files, Sequential Files, Index-Sequential Files, Direct Files.

November & December Unit-III & Unit IV

Normalization: Schema Refinement, Problems caused by redundancy. Decomposition & its properties,

Normalization: First, Second, Third Normal forms, BCNF, Multivalued Dependencies, Join Dependencies.

Transaction Management & Concurrency Control: ACID properties, Transactions and Schedules,

Concurrent execution of transaction, Serializability and Recoverability, Lockbased Concurrency control, Lock Management, Lock Conversion, Dealing with deadlocks, Concurrency without Locking

Crash Recovery and Backup: Failure classifications, storage structure, Recovery & Atomicity, Log base recovery, Recovery with concurrent transactions, Failure with loss of nonvolatile storage, Database backup &recovery from catastrophic failure, Remote Backup System.

BCA 3RD YEAR

Data Communication and Networking

July & August UNIT-1

Introduction to Computer Communications and Networking Technologies; Uses of Computer Networks; Network Devices, Nodes, and Hosts; Types of Computer Networks. and their Topologies; Network Software: Network Design issues and Protocols; 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, Network Architecture and the OSI Reference Model, TCP/IP reference model, Example Networks: The Internet, X.25, Frame Relay, ATM.

September & October UNIT - II

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, Data Rate and Bandwidth, Capacity, Baud Rate; Asynchrous and synchrous transmission, data encoding techniques, Modulation techniques, Digital Carrier Systems; Guided and Wireless Transmission Media: Communication Satellites; Switching and Multiplexing: Dialup Networking: Analog Modem Concepts; DSL Service.

November & December UNIT – III & IV

Data Link Layer: Framing, Flow Control, Error Control; Error Detection and Correction; Sliding Window Protocols: Media Access Control: Random Access Protocols, Token Passing Protocols; Token Ring; Introduction to LAN technologies: Ethernet, switched Ethernet, VLAN, fast Ethernet, gigabit Ethernet, token ring, FDDI, Wireless LANs, Bluetooth; Network Hardware Components: Connectors, Transceivers, Repeaters, Hubs, Network Interface Cards and PC Cards, Bridges, Switches, Routers, Gateways.

Network Layer and Routing Concepts: Virtual Circuits and Datagrams; Routing Algorithms: Flooding, Shortest Path Routing, Distance Vector Routing; Link State Routing, Hierarchical Routing, Congestion Control Algorithms; Internetworking: Network Security Issues: Security threats; Encryption Methods: Authentication; Symmetric - Key Algorithms; Public-Key Algorithms.

BCA 3RD YEAR

MANAGEMENT INFORMATION SYSTEM

July & August UNIT-1

Introduction to system and Basic System Concepts, Types of Systems, The Systems Approach, Information System: Definition & Characteristics, Types of information, Role of Information in Decision-Making, Sub-Systems of an Information system: EDP and MIS management levels, EDP/MIS/DSS.

September & October UNIT-11

An overview of Management Information System: Definition & Characteristics, Components of MIS, Frame Work for Understanding MIS: Information requirements & Levels of Management, Simon's Model of decision-Making, Structured Vs. Un-structured decisions, Formal vs. Informal systems.

Number & December UNIT-III & IV

Developing Information Systems: Analysis & Design of Information Systems: Implementation & Evaluation, Pitfalls in MIS Development.

Functional MIS: A Study of Personnel, Financial and production MIS, Introduction to e-business systems, ecommerce technologies, applications, Decision support systems support systems for planning, control and decision-making

BCA !st Year

July & August

By the end of the course the students will be able to: CO I: Gain knowledge of essential computing concepts and its applications in various fields. CO2: Develop proficiency m writing, debugging, and executing C programs to efficiently solve computational problems. C03: Demonstrate an understanding of data types, control structures, functions, arrays, and pointers. COS: C04: Cultivate Apply problem-solving skills through algorithmic thinking and programming techniques in C. maintainability, modular programming principles to effectively organize and structure code for improved scalability, and code reuse in C programming projects.

September & October

Overview of computing principles and history, Generations of Computers, Applicationsofcomputersinvariousfields.lnput/OutputDevices,Memory: along with its components, Classification of computers, memory, Concept of primary & secondary Cache Memory, Secondary storage devices.

November & December

Basics of Networking & Operating System: Introduction to computer networking, Network types, Network topologies. Internet and its applications Operatmg system and its functions. **Introduction to software development methodologies:** Basics of algorithmic thinking and problem-solvingies Planning the Computer Program: Problem definition , Program design, Debugging, Types of errors in programming, Techniques of problem Solving Flowcharting Algorithms . **Introduction to the C programming language:** History of C Elements of C: C character