**Lesson Plan**

**Subject- BCA-364: Internet Technologies**

**Class- BCA 6th Sem**

**Teacher- Ms. Ritu Baniwal**

| **Week** | **Topics to be covered** |
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| Week 1 | **Unit- 1**  Internet: Introduction; History; Internet Services; TCP/IP: Architecture, Layers, Protocols |
| Week 2 | **Unit- 1**  TCP/IP model versus OSI Model, World Wide Web (WWW) - The Client Side, The Server Side, Creating and Searching Information on the Web, Popular Search Engines, URL, HTTP, Web Browsers |
| Week 3 | **Unit- 1**  Chat & Bulletin Board, USENET & NNTP (Network News Transfer Protocol); Internet vs. Intranet  Test |
| Week 4 | **Unit- 2**  TCP, UDP and IP Protocols, Port Numbers; Format of TCP, UDP and IP; TCP Services; TCP Connection Management; Remote Procedure Call |
| Week 5 | **Unit- 2**  IPv4 addressing; The need for IPv6; IPv6 addressing and packet format; IP Address Resolution- DNS; Domain Name Space; DNS Mapping; Recursive and Iterative Resolution |
| Week 6 | **Unit- 2**  Mapping Internet Addresses to Physical Addresses: ARP, RARP, DHCP; ICMP; IGMP  Practice Tests |
| Week 7 | **Unit- 3**  Application Layer: Electronic Mail: Architecture; Protocols - SMTP, MIME, POP, IMAP; Web Based Mail |
| Week 8 | **Unit- 3**  File Access and Transfer: FTP, Anonymous FTP, TFTP, NFS; Remote Login using TELNET |
| Week 9 | **Unit- 3**  Voice and Video over IP: RTP, RTCP, IP Telephony and Signaling, RSVP |
| Week 10 | **Unit- 4**  Routing in Internet: RIP, OSPF, BGP; Internet Multicasting; Mobile IP; Private Network Interconnection: Network Address Translation (NAT) |
| Week 11 | **Unit- 4**  Virtual Private Network (VPN); Internet Management and SNMP, Internet Security: E-Mail Security; Web Security; Firewall; Introduction to IPSec and SSL  Test |
| Week 12 | Revision and Practice Tests |

**Lesson Plan**

**Subject- B23-CAP-401: Data Structures and Applications**

**Class- BCA 4th Sem**

**Teacher- Ms. Ritu Baniwal**

| **Week** | **Topics to be covered** |
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| Week 1 | **Unit- 1**  **Data Structure** Definition, Data Type vs. Data Structure, Classification of Data Structures, Data Structure Operations, Applications of Data Structures. |
| Week 2 | **Unit- 1**  **Algorithm Specifications**: Performance Analysis and Measurement (Time and Space Analysis of Algorithms- Average, Best and Worst Case Analysis).  **Arrays**: Introduction, Linear Arrays, Representation of Linear Array in Memory, Two Dimensional and Multidimensional Arrays, Sparse Matrix and its Representation |
| Week 3 | **Unit- 1**  **Arrays**: Operations on Array: Algorithm for Traversal, Selection, Insertion, Deletion and its implementation.  Test |
| Week 4 | **Unit- 2**  **String Handling**: Storage of Strings, Operations on Strings viz., Length, Concatenation, Substring, Insertion, Deletion, Replacement, Pattern Matching |
| Week 5 | **Unit- 2**  **Linked List**: Introduction, Array vs. linked list, Representation of linked lists in Memory, Traversing a Linked List, Insertion, Deletion |
| Week 6 | **Unit- 2**  **Linked List**: Searching into a Linked list, Type of Linked List.  Practice Tests |
| Week 7 | **Unit- 3**  **Stack**: Array Representation of Stack, Linked List Representation of Stack, Algorithms for Push and Pop, Application of Stack: Polish Notation, Postfix Evaluation Algorithms, Infix to Postfix Conversion, Infix to Prefix Conversion, Recursion. |
| Week 8 | **Unit- 3**  **Introduction to Queues**: Simple Queue, Double Ended Queue, Circular Queue, Priority Queue, Representation of Queues as Linked List and Array, Applications of Queue. |
| Week 9 | **Unit- 3**  Algorithm on Insertion and Deletion in Simple Queue and Circular Queue. Priority Queues.  Practice Test |
| Week 10 | **Unit- 4**  **Tree:** Definitions and Concepts, Representation of Binary Tree, Binary Tree Traversal (Inorder, postorder, preorder) |
| Week 11 | **Unit- 4**  **Binary Search Trees –** Definition, Operations viz., searching, insertions and deletion  **Searching and Sorting Techniques:** Sorting Techniques: Bubble sort, Merge sort, Selection sort, Insertion Sort. |
| Week 12 | **Unit- 4**  Quick sort, Searching Techniques: Sequential Searching, Binary Searching.  Revision and Practice Tests |

**Lesson Plan**

**Subject- B23-SEC-201: Cloud Computing Skills**

**Class- BCA 2nd Sem**

**Teacher- Ms. Ritu Baniwal**

| **Week** | **Topics to be covered** |
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| Week 1 | **Unit- 1**  Basic Concepts of Cloud Computing, Computer Network Basics, |
| Week 2 | **Unit- 1**  Concepts of Distributed Systems. Concepts of Cloud Computing and its necessity. |
| Week 3 | **Unit- 1**  Cloud Service Providers in use and their significance.  Test |
| Week 4 | **Unit- 2**  Cloud Infrastructure, Cloud Pros and Cons |
| Week 5 | **Unit- 2**  Cloud Delivery Models |
| Week 6 | **Unit- 2**  Cloud Deployment Models  Practice Tests |
| Week 7 | **Unit- 3**  Cloud Storage Management, Concept of Virtualization and Load Balancing. |
| Week 8 | **Unit- 3**  Overview on Virtualization used for Enterprise Solutions. |
| Week 9 | **Unit- 3**  Key challenges in managing information. Identifying the problems of scale and management in big data.  Practice Test |
| Week 10 | **Unit- 4**  Building Cloud Networks, Designing and Implementing a Data Centre-Based Cloud service. |
| Week 11 | **Unit- 4**  Amazon Web Services (AWS), Google Cloud Platform. |
| Week 12 | **Unit- 4**  Revision and Practice Tests |

**Lesson Plan**

**Subject- CS-Computer Networks**

**Class- BA 6th Sem**

**Teacher- Ms. Ritu Baniwal**

| **Week** | **Topics to be covered** |
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| Week 1 | Unit- 1  Introduction to Data Communication and Computer Networks; Uses of Computer Networks; Types of Computer Networks |
| Week 2 | Unit- 1  Network Topologies; Network Hardware Components: Connectors, Transceivers, Repeaters, Hubs, Network Interface Cards and PC Cards, Bridges, Switches, Routers, Gateways |
| Week 3 | Unit- 1  Network Software: Network Design issues and Protocols; Connection-Oriented and  Connectionless Services; OSI Reference Model; TCP/IP Model  Test |
| Week 4 | Unit- 2  Analog and Digital data and signals; Bandwidth and Data Rate, Capacity, Baud Rate, Guided Transmission Media; Wireless Transmission |
| Week 5 | Unit- 2  Communication Satellites, Switching and Multiplexing; Modems and Modulation techniques  Practice Tests |
| Week 6 | Unit- 3  Data Link Layer Design issues; Error Detection and Correction; Sliding Window Protocols: One-bit, Go Back N and Selective Repeat |
| Week 7 | Unit- 3  Media Access Control: ALOHA, Slotted ALOHA, CSMA, Collision free protocols |
| Week 8 | Unit- 3  Introduction to LAN technologies: Ethernet, Switched Ethernet, Fast Ethernet, Gigabit Ethernet; Token Ring |
| Week 9 | Introduction to Wireless LANs and Bluetooth  Test |
| Week 10 | Unit- 4  Routing Algorithms: Flooding, Shortest Path Routing, Distance Vector Routing; Link State Routing, Hierarchical Routing  Practice Tests |
| Week 11 | Unit- 4  Congestion Control; Traffic shaping; Choke packets; Load shedding; Application Layer: Introduction to DNS, E-mail and www services |
| Week 12 | Unit- 4  Network Security Issues: Security attacks; Encryption methods; Digital Signatures.  Revision and Test |