Vidnyan Mahavidhyalaya Sangola
Department of Computer Science
Teaching Plan

Teacher Name: Mr Bhanvase D.P. **Academic Year: 2018-19**

Class	Subject	Month	
B.Sc (ECS) – III **Sem-V**	**Data Communication and Networking – I**	**July**	Data Communication: Internet: History of Internet, The ARPANET, NSFNET, Internet usage Architecture of the internet, Components, Data Representation, Data Flow, Communication Model. Computer Network: Introduction of Network, Uses of a computer network, Network Criteria, Network Topologies, Types of Networks, Inter-networking, Applications of Internet. **Network Models:** Protocols & Standards, Protocol Hierarchies, Design Issues of Layers, Services Primitives, Connection oriented and connection less services Reference Model: ISO-OSI reference model, TCP/IP reference model.
		August	Signals: Analog & Digital Signals, Period, Frequency, Phase, Amplitude, Bandwidth, Bit Rate, Bit Length, Fourier analysis. Transmission Impairment: Attenuation, Distortion, Noise, Nyquiest Theorem, Shannon Capacity Theorem. Transmission Media: Guided Media-Magnetic Media, Twisted Pair, Coaxial Cable, Fiber Optic Cable, Unguided Media- Wireless Radio Waves, Microwaves, Infrared, Satellite Communication Analog Transmission: Modem, Telephone System, RS232C, Modulation - Amplitude Modulation, Frequency Modulation, Phase Modulation Digital Transmission: Pulse Code Modulation, Manchester & Differential Manchester Coding. Transmission Mode: Parallel, Serial, Synchronous Transmission, Asynchronous Transmission. Multiplexing- Frequency Division Multiplexing, Time Division Multiplexing, Wavelength Division Multiplexing. Switching- Circuit Switching, Message Switching, Packet Switching.
		September	**Data link layer:** Data link layer Design issues, Error Detection & Correction: Types of Errors, Hamming Distance, Error Detection: Parity Check, Cyclic Redundancy Check, Checksum Check Error correction, Data Link Control: Framing, Flow & Error Control, Protocols: Simplex, Stop and Wait, Stop and Wait ARQ, Go

			Back N ARQ, Selective repeat ARQ. Multiple Access Protocol: ALOHA, CSMA, CSMA/CD, CSMA/CA Channelization, FDMA, TDMA, CDMA
		October	**Network layer:** Network layer Design issues, Routing Algorithm: Optimality Principle, Shortest Path Routing, Distance Vector Routing, Link State Routing, Broadcast Routing, Multicast Routing Congestion Control Algorithm: General principle of congestion control, Congestion prevention policies, Congestion Control in Virtual-Circuit Subnets, Congestion Control in Datagram Subnets.

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B. Sc – (ECS)-II **Sem-III**	**OPERATING SYSTEM**	**July**	Introduction Operating System:- Definition Operating systems, Types of Operating Systems-Batch, Multiprogramming, Time-Sharing, Real-Time, Distributed, Parallel., OS Service, System components, System Calls Process Management:-Concept of Process, Process states, Process Control Block, Context switching, Operations on Process, Co-operating Process, Threads – Types of threads, Benefits of threads.
		August	Concept of Process Scheduling- Types of Schedulers ,Scheduling criteria , Scheduling algorithms : Preemptive and Non-pre emptive , FCFS, SJF, Round Robin, Priority Scheduling,Multilevel Queue Scheduling, Multilevel- feedback Queue Scheduling. Process Synchronization and Deadlocks:-The Producer Consumer Problem, Race Conditions, Critical Section Problem, Semaphores, and Classical Problems of Synchronization: Reader-Writer Problem,

			Dinning Philosopher Problem, Critical Regions. Definition, System Model, Dead Lock Characterization, Resource Allocation Graph, Methods of Handling Dead Locks- Deadlock Prevention, Deadlock Avoidance -banker's algorithm,resource-request algorithm, Deadlock detection and Recovery
		September	Memory Management:-Basic Hardware Address Binding, Logical and Physical address Space, Dynamic Loading, Overlays, Swapping, Memory allocation: Contiguous Memory allocation – Fixed and variable partition – Internal and External fragmentation and Compaction, Paging, Segmentation. Basics of Virtual Memory, demand paging, Page fault, Page Replacement policies: Optimal (OPT), First in First Out (FIFO), Least Recently used (LRU), Thrashing.
		October	Storage Management:- File Management: File concept, Access methods, File types, File operation, Directory structure, File System structure, Allocation methods (contiguous, linked, indexed), Free-space management (bit vector, linked list, grouping). Disk Management: disk structure, disk scheduling (FCFS, SSTF, SCAN,CSCAN) , disk reliability, disk Formatting, boot block, bad blocks.

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Class	Subject	Month	
B. Sc – (ECS)-III **Sem- VI**	**Data Communication and Networking – II**	**December**	**Transport, Session, Presentation & Application layers**: Elements of Transport Protocols-Addressing, Connection establishment, Connection Release, Flow Control & Buffering, TCP/IP protocol suite- Transmission Control Protocol, User Datagram Protocol, IP, Real Time Transport Protocol, FTP, DNS, TelNet, SMTP, POP, HTTP, WWW,

			SNMP, ARP, RARP etc., Data Compression-Audio Compression, Video Compression.
		January	**Network Security:** Introduction about Network security, Security Techniques-Encryption & decryption, Digital Signatures, Cryptography, Firewall Security Services, Authentication Mechanisms- Passwords, Smart Card, Biometrics.
		February	**Network Devices & Services**: Network Devices-Hubs, Switches, Repeaters, Bridges, Routers, Gateways Network Services-VPN, Virtual LAN, Wi-Fi Network, Remote Sensing, GPS GPRS, GSM, Bluetooth, Video Conferencing. **Web Security**: SSL Encryption, TLS, SET, E-mail Security, PGPs / MIME, IP Security.
		March	**CASE study-Linux:** Installing client & server, Roles & responsibility of Network Administrator Server Management-Login Script, Ftp Server, News & search server, Web Server, Samba Server, Mail Server, Proxy Server, Print Server, User & group management.

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B. Sc – (ECS)-I Sem- II	Programming in JAVA	December	Introduction to Java Java Architecture and Features, Understanding the semantic and syntax differences between C++ and Java, Compiling and Executing a Java Program, Variables, Constants, Keywords Data Types, Operators (Arithmetic, Logical and Bitwise) and Expressions, Comments, Doing Basic Program Output, Decision Making Constructs (conditional statements and loops) and Nesting, Java Methods (Defining, Scope, Passing and Returning Arguments, Type Conversion and Type and Checking, Built-in Java Class Meth
		January	Arrays, Strings and I/O:- Creating & Using Arrays (One Dimension and Multi-dimensional), Referencing Arrays Dynamically, Java Strings: The Java String class, Creating & Using String Objects, Manipulating Strings, String Immutability & Equality, Passing Strings To & From Methods, String Buffer Classes. Simple I/O using System. out and the Scanner class, Byte and Character streams, Reading/Writing from console and files.
		February	Object-Oriented Programming Overview :Principles of Object-Oriented Programming, Defining & Using Classes, Controlling Access to Class Members, Class Constructors, Method Overloading, Class Variables & Methods, Objects as parameters, final classes, Object class, Garbage Collection.
		March	Inheritance, Interfaces, Packages, Enumerations Inheritance: (Single Level and Multilevel, Method Overriding, Dynamic Method Dispatch, Abstract Classes), Interfaces and Packages, extending interfaces and packages, Package and Class Visibility, Using Standard Java Packages (util, lang, io, net), Wrapper Classes, Autoboxing/Unboxing, Enumerations and Metadata.

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