CSE111:ORIENTATION TO COMPUTING-I

L:2 T:0 P:0 Credits:2

Course Outcomes: Through this course students should be able to

CO1 :: explore about the structure of computer and its various peripheral devices

CO2 :: recognize the significance of disk partitioning for the deployment of an operating system

CO3 :: describe the differentiation and usefulness of various shell commands

CO4 :: analyze different types of network topologies, network devices and functionalities of different servers

CO5 :: understand the basic concepts and terminologies about the security aspects associated with secure web browsing

CO6 :: practice technical concepts in various tools and create technical profiles on different computing platforms

Unit I

Computer Systems : Basic structure of computer and its working, Computer associated peripherals, Memories - RAM, ROM, Secondary storage devices, System Configuration – features and comparison (SSD vs hybrid, types of RAMs, Processors - cores/threads), BIOS Configuration, Compare and contrast PC connection interface (USB, SATA, HDMI, NFC, Bluetooth), RAID, GPU basics, Synchronization across CPU and GPU.

Computer Languages : Machine language, Assembly language, High level language, Steps in development of a program, Compilation and Execution, Compiler, Interpreter, Assembler.

Unit II

Operating System : Operating Systems and its components, Windows Operating System Versions and features, Installation Process, Directory Hierarchy of Windows Operating System (Single level and multiple level), Bootloader.

Linux Operating System : Linux OS and its features, Distribution versions, installation process, Directory Hierarchy of Linux System (single level and multiple level)., Partitions: Understanding disk partitions and obtaining partition information using system tools, Comparison of windows and Linux OS, Virtual Machines.

Unit III

File system management : File system basics, Types of file systems (FAT, GFT, HFS, NDFS, UDF, Extended file systems), Pipes and redirection, Searching the file system using find and grep with simple regular expressions, Basic process control using signals, Pausing and Resuming process from a Linux terminal, terminating a process, Adding/removing from search path using PATH variable.

Other Shell commands : ls, cat, man, cd, touch, cp, mv, rmdir, mkdir, rm, chmod, pwd, ps, kill, etc, Kernel and types of kernels.

Unit IV

Computer Network and Communication : Network types (wired and wireless), Network topologies, Network communication devices (Routers, Switches, Modems, Hubs, access point), Setting IP addresses, sharing files and folders, Remote Login, SSH, Wireless Security (http vs https), Client Server model, Types of Servers (Proxy servers, Application server, Web server, File server, Database server, Synchronization server, Log server).

Cloud Computing : Types of cloud (Public, Private, Hybrid, Community), Cloud based services (SaaS, PaaS,IaaS, FaaS), Virtualization Types, Hypervisior Types (Type 1 and Type 2), Major cloud service providers.

Unit V

Security Essentials : Basic security threats (malwares, Phishing, Social engineering, Password cracking), Password management (Password complexity, Change default passwords), Open WiFi vs. secure WiFi, Multi Factor authentication, Admin vs. user vs. guest Account.

Secure web-browsing : Recognize a secure connection, Recognize suspicious links, Update Browsers and plugins, Recognize untrusted source warnings, social media security (facebook, whatsapp, email).

Unit VI

Version Control : Overview of Git and GitHub, Install git and create a GitHub account, Create a local git repository, Add a new file to the repository, Creating a commit, Creation of a new Branch

MOOCs/Hackathons : Introduction to MOOCs/Hackathons, MOOCs types, platforms, benefits, Globally recognized hackathons/competitions, FAANG companies

Unit VI **Profile Creation** : Figma, GitHub, Stack overflow, HackerRank, HackerEarth, GeeksforGeeks.

References:

1. RED HAT RHSCA/RHCE 7 by SANDER VAN VUGT, PEARSON

2. DATA COMMUNICATIONS AND NETWORKING WITH TCP IP PROTOCOL SUITE by BEHROUZ A. FOROUZAN, MC GRAW HILL

3. OPERATING SYSTEM CONCEPTS by ABRAHAM SILBERSCHATZ, PETER B. GALVIN, GERG GAGNE, WILEY