CSE111:ORIENTATION TO COMPUTING-I

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

Course Outcomes: Through this course students should be able to

CO1 :: understand the various functional components and basic structure of a computer system

CO2 :: explain operating system and its functions, directory hierarchy, kernel types and basic of computer languages

CO3 :: describe Linux OS features, shell commands, virtual machine concepts and file management system

CO4 :: analyze cohorts and pathways based on skillsets and explore MOOC platforms for professional growth

CO5 :: understand network and its components, also identify security issues effectively

CO6 :: utilize Git, GitHub, AI tools, and professional platforms to enhance technical skills with ethical digital practices

Unit I

Computer System : Basic structure of a computer and its components, Memories and its types- RAM, ROM, Secondary storage devices, SSD vs HDD, Processors and GPU, PC connection interface- USB, SATA, HDMI, NFC, Bluetooth, Introduction to RAID and RAID levels.

Unit II

Operating System : Operating System and its architecture, Types of Operating System, Functions of Operating System, Directory Hierarchy, Bootloader, Kernel and types of Kernels.

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

Unit III

Linux Operating System : Linux OS and its features, Distribution versions, Shell commands - ls, cat, man, cd, touch, cp, mv, rmdir, mkdir, rm, chmod, pwd, ps, kill, etc, Comparison of windows and Linux OS, Virtual Machine – introduction, VM software, creating and managing VMs.

File system management : File system basics, Types of file system- FAT, GFT, HFS, NDFS, UDF, Extended file system.

Unit IV

Cohorts and Skill Sets : Introduction to Cohorts, Purpose of Cohorts, Companies, Skills required and skill sources for different Cohorts (Internal and External)

Types of Cohorts : Cloud Computing, Data Science, Machine Learning, Software development (Product and Service based), Full Stack Web Development, Software Methodologies and Testing, Teaching and Research, Cyber Security Cohorts.

Pathways : Introduction to Pathways, Purpose of Pathways, Job Roles for Different Pathways, Types of Pathways: Product Based, Service Based, Government Jobs, Higher studies, Entrepreneurship

MOOCs and Hackathons : Introduction to MOOCs and Hackathons, Types of MOOCs, Various MOOCs Platforms, Benefits of MOOCs, Globally Recognized Hackathons and Competitions, MAANG Companies

Unit V

Computer Network and Communication : Introduction to Computer Network and its types, Network topologies, Network communication devices- Routers, Switches, Modems, Hubs, access point, Client Server Model.

Security Essentials : Basic security threats- Malwares and its types- Virus, Worm, Trojan horse, Spyware, Ransomware, Phishing, Password cracking, Multi Factor authentication, User Account Types and Privileges- Admin, User, Guest, Firewall basics.

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 Profile.

Modern AI Trends and Tools : Introduction to AI, Real life application of AI, Introduction to Generative AI and its types, Generative AI tools– Text Generation Tools: ChatGPT, Gemini AI, Image Generation Tools, Video and animation tools, Research Tools: Perplexity AI, NotebookLM, JenniAI, Prompt Engineering – Good vs poor prompt, Ethical use of AI and AI tools.

Profile Creation : Figma, GitHub, Stack overflow, HackerRank, HackerEarth, GeeksforGeeks, Leetcode.

References:

1. COMPUTER FUNDAMENTALS by PRADEEP K. SINHA AND PRITI SINHA, BPB Publication, New Delhi

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

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