CO4: be able to determine and evaluate selection of applications and protocols for data communication

Syllabus

Unit-I: TCP/IP Architecture and IP Packet, IP Addressing, Subnetting, and Subnet Routing.

Unit-II: Classless Interdomain Routing (CIDR), ARP, Fragmentation and Reassembly, DHCP, NAT, IPv6

Unit-III: Transmission Control Protocol: UDP and TCP, TCP: Three-way Handshake, TCP Flow Control and Data Transfer, TCP Congestion Control, RTT-based Congestion Control for a Datacenter.

Unit-IV: Advanced Topics: Mobile IP, Multicast Routing, OpenFlow, SDN, and NFV, Network Security Threats

Readings:

1. Douglas E Comer, "Internetworking with TCP/IP Principles, Protocol, and Architecture" , Volume I, 6th Edition, Pearson Education, 2015.
2. Internetworking with TCP/IP Volume II: ANSI C Version: Design, Implementation, and Internals, Pearson Education India; 3rd edition, 2015.
3. William Stallings, "Data and Computer Communications", 9th Edition, Pearson Education, 2011

MCSC204: CLOUD COMPUTING [3-0-1]

Course Objectives: This course aims to provide students with a solid understanding of parallel and distributed computing and cloud computing. Students will learn about cloud computing's characteristics, benefits, and historical developments, including distributed systems, virtualization, and service-oriented computing. They'll also grasp cloud computing architecture, service models (IaaS, PaaS, SaaS), deployment models, and emerging paradigms like Edge Computing and Mobile Cloud Computing.

Course Learning Outcomes :

On completing this course, the student will be able to:

CO1: Understand cloud computing's characteristics, benefits, and historical developments, including distributed systems and virtualization.
CO2: Master cloud computing architecture, service models, deployment models, and practical application of cloud technologies.

CO3: Analyze cloud economics, address open challenges, and comprehend emerging paradigms like Edge Computing and Mobile Cloud Computing, applying theoretical knowledge to real-world scenarios effectively.

Syllabus:

Introduction to Parallel and Distributed Computing; Introduction to Cloud Computing; Characteristics and benefits of cloud computing; Historical developments and evolution of cloud computing: Distributed Systems, Virtualization, Web 2.0, Service-oriented computing.

Utility Computing; Cloud Computing Reference Model. Introduction to virtualization; Characteristics of virtualized environments; Taxonomy of virtualization techniques; Virtualization and cloud computing; Pros and cons of virtualization; Technology examples: Xen: paravirtualization, VMware: full virtualization, Microsoft Hyper-V.

Cloud Computing Architecture; Service models: Infrastructure as a Service (IaaS), Platform as a Service (PaaS), Software as a Service (SaaS); Deployment models: Public, Private, Hybrid, Community; IaaS: Introduction to IaaS, Resource Virtualization i.e. Server, Storage and Network virtualization; PaaS: Introduction to PaaS, Cloud platform & Management of Computation and Storage; SaaS: Introduction to SaaS, Cloud Services, Web services, Web 2.0, Web OS; Case studies related to IaaS, PaaS and SaaS.

Economics of the cloud; Open Challenges in Cloud Computing; Introduction to emerging computing paradigms and research challenges: Edge Computing, Mobile Cloud Computing, Fog Computing etc.; Introduction to IoT Cloud; Study on simulators related to cloud computing and emerging computing paradigms.

Readings:

1. R. Buyya, C. Vecchiola, S. ThamaraiSelvi, Mastering Cloud Computing, McGraw Hill Education.

2. B. Sosinsky, Cloud Computing Bible, Wiley.

3. K. Hwang, G. C. Fox, J.Dongarra, Distributed and Cloud Computing: From Parallel Processing to the Internet of Things, Morgan Kaufmann

MCSC205 READING SKILLS [0-0-2]

Course Objectives: The course aims to develop an important skills of independent reading.

Course Learning Outcomes:

On completing this course, the student will be able to:

CO1: Develop a habit of independent reading.

CO2: Given a requirement, independently select sources of reading.

CO3: Read and assimilate independently.

This is a self-study course. The students will carry out extensive reading on a topic to be