SANT GADGE BABA AMRAVATI UNIVERSITY GAZETTE

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PART- TWO

(Extra Ordinary)

Friday, the 24th January, 2025

NOTIFICATION

No. 14 /2025 Date: 24/01/2025

Subject: Corrections in the existing syllabus of the subject 4KS02 Data Communication and Networking of Semester IV of B.E. (Computer Science &Engineering) (C.B.C.S.).

Ref'ce : i) SGBAU Gazette Part II Notification No. 89/2020 dated 26.10.2020.
ii) SGBAU Gazette Part II Notification No. 121/2023 dated 17.08.2023.

It is notified for general information of all concerned that the authorities of the University have accepted to implement the corrected syllabus of the subject **4KS02 Data Communication & Networking of Semester IV of B.E. (Computer Science & Engineering) (C.B.C.S.)** to be implemented from the academic session 2024-2025 & onwards as mentioned below:

Sd/-
(Dr.Avinash Asanare)
Registrar
Sant Gadge Baba Amravati University

4KS02 DATA COMMUNICATION AND NETWORKING

Course Objectives:

Throughout the course, students will be expected to demonstrate their understanding of Data Communication and Networking by being able to do each of the following:

- Study the basic taxonomy and terminology of the digital communication system & computer networking and enumerate the layers of OSI model and TCP/IP model.
- Acquire knowledge of Application layer paradigms and protocols.
- Study Transport layer design issues, Transport layer services, and protocols.
- Gain core knowledge of Network layer routing protocols and IP addressing.
- Study data link layer concepts, design issues, and protocols.

Course Outcomes (CO's):

On completion of the course, the students will be able to:

1. Describe the functions of each layer in OSI and TCP/IP model.
2. Describe the Transport layer and Transport layer services.
3. Classify the routing protocols and analyze how to assign the IP addresses for the given network.
4. Explain the functions of Application layer and Presentation layer paradigms and Protocols.
5. Describe the functions of data link layer and explain the protocols.
6. Explain the types of transmission media with real time applications.

SYLLABUS

Unit I: (Hours: 06) [CO 1]
Introduction to Network Models -
Data Communication Components: Basic network types, switching mechanisms, Internet standards. **Layered Architecture**: Overview of the OSI and TCP/IP models, focusing on key functions of each layer.

Unit II: (Hours: 06) [CO6]
Transmission Media: Guided vs. Unguided media, key characteristics, and real-time application examples. **Switching Techniques**: Circuit, Packet, and Virtual Circuit Switching.

Unit III: (Hours: 06) [CO 4]
Application Layer Protocols -
Application Layer Overview: Client-server model, APIs, P2P networking. **Key Protocols**: HTTP, FTP, SMTP, DNS, focusing on their importance in internet communication.

Unit IV: (Hours: 06) [CO 2]

Transport Layer Fundamentals -
Transport Layer Overview: Principles of connectionless and connection-oriented services. **Key Protocols**: UDP, TCP – Concepts of reliability, congestion control, flow control. **Multiplexing and Demultiplexing**: Basic mechanisms and their relevance in data transmission.

Unit V: (Hours: 06) [CO 3]
Network Layer Protocols and IP Addressing –
Network Layer Overview: Services provided by the network layer, datagram vs. virtual circuit approaches. **IP Addressing**: IPv4, IPv6, NAT, DHCP, and ICMP functionalities. **Routing**: Introduction to routing algorithms (Distance Vector and Link-State), basic concept of forwarding.

Unit VI: (Hours: 06) [CO 5]
Data Link Layer and MAC Protocols -
Data Link Layer Services: Framing, error detection (CRC, Checksum), and correction techniques. **MAC Layer**: Concepts of LAN addressing, ARP, CSMA/CD, and PPP. **Link Layer Protocols**: HDLC and Point-to-Point Protocol.

Text Books:

1. Behrouz A. Forouzan: Data Communication and Networking, (5/e) (TMH)
2. James F. Kurose & K W Ross: Computer Networking, Pearson Education (LPE)

Reference Books:

1. William Stallings: Data & Computer Communications, 6/e, Pearson Education.
2. William L. Schweber: Data Communication, McGraw Hill.
3. Douglas E. Comer: Computer Network & Internet, Addison Wesley.
4. Andrew S. Tanenbaum: Computer Networks, PHI (5E).
5. Leon Garcia & Widjaja: Communication Networks, TMH.

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