CIT 4307: Data Communication

Contact Hours: 45 hours

Purpose: This unit of study prepares gives an in depth understanding in the areas of data communications and networking.

Expected Learning Outcomes

At the end of this course the student should be able to:

i. Discuss the evolution of early networks and the Internet.
ii. Explain universal network standards.
iii. Describe the responsibilities of the ISO reference model.
iv. Explain the hierarchical, layered structure of a typical network architecture.

Course Content

Data Communications Concepts: DTEs and DCEs, packets and frames, IP Packets. Modems. DSL vs Cable. Digital network services and equipment: routers, multiplexers, switches. LANs: Ethernet, 802 standards, categories of cables, LAN switches. OSI model and protocol stacks. Internetworking with TCP/IP: structure and functionality. IP addressing: classes, public vs private, static vs dynamic, DHCP and NATs. WANs, Routers and bandwidth on demand. End to End Communication: Packet switching and circuit switching networks. Voice Digitization, DS0 – DS3, and Carrier Systems like T1, SONET and ISDN. Wireless Telecommunication: cellular and CDMA, GSM/TDMA/GPRS; Wi – Fi. TCP over MPLS. Multimedia Communication and QoS: Performance and quality issues. Voice over IP (VOIP). VPNs. ISPs, access and security issues. Transparent network services: DNS, HTTP, web server design, caching and CDNs.

BSCS/SEP2020/F-FT	WEDNESDAYS 10.00 AM TO 1.00 PM
BTIT/SEP2020/J-FT	TUESDAYS 7.00 AM TO 10.00 AM
BSSC/SEP2020/J-FT	TUESDAY 10.00 AM TO 1.00 PM

WEEK	CONTENT
1-3	Data Communications Concepts: DTEs and DCEs, packets and frames, IP Packets. OSI model and protocol stacks. Internetworking with TCP/IP: structure and functionality. IP addressing: classes, public vs private, static vs dynamic, DHCP and NATs. *assignment 1*
4-5	Voice Digitization, DS0 – DS3, and Carrier Systems like T1, SONET and ISDN. CA
6	High Speed Digital Access: Modems. DSL vs Cable.
7-8	Digital network services and equipment: routers, multiplexers, switches. LANs: Ethernet, 802 standards, categories of cables, LAN switches. WANs, Routers and bandwidth on demand. Assignment 2/CA 2
9	End to End Communication: Packet switching and circuit switching networks.
10	Wireless Telecommunication: cellular and CDMA, GSM/TDMA/GPRS; Wi – Fi. TCP over MPLS.
11	Multimedia Communication and QoS: Performance and quality issues.
12	Voice over IP (VOIP). VPNs. ISPs, access and security issues. Transparent network services: DNS, HTTP, web server design, caching and CDNs.

Mode of Delivery

Lectures, tutorials, practicals.

Instructional Materials /Equipment

A computer infrastructure workshop, networking equipment, lecture notes, illustration charts,

audio and video cassettes, journals, overhead presentation equipment.

Assessment

Type	Weighting (%)
Examination	70%
Continuous Assessment	30%
Total	100%

Core Text Books

i. Forouzan, B. A. (2013). *Data Communications and Networking* (5th ed.). New York: McGraw-Hill. ISBN: 0073376221.
ii. Stallings, W. (2014). *Data and Computer Communications* (10th ed.). Harlow, UK: Pearson Education. ISBN: 1292014385.
iii. White, C. M. (2015). *Data Communications and Computer Networks: A Business User's Approach* (5th ed.). Boston, MA: Course Technology. ISBN: 1305116631.

Core Journals

i. Journal of Communications and Networks. ISSN: 1976-5541.
ii. Digital Communications and Networks. ISSN: 2352-8648.
iii. Journal of Network and Computer Applications. ISSN: 1084-8045.

Recommended Text Books

i. FitzGerald, J., Dennis, A., & Durcikova, A. (2015). *Business Data Communications and Networking* (12th ed.). Hoboken, NJ: John Wiley & Sons, Inc. ISBN: 1118891686.
ii. Gupta, P. C. (2014). *Data Communications and Computer Networks* (2nd ed.). Delhi: PHI Learning Private Ltd. ISBN: 8120348648.
iii. Stallings, W., & Case, T. (2013). *Business Data Communications: Infrastructure, Networking and Security* (7th ed.). Boston, MA: Pearson Education. ISBN: 0133023893.

Recommended Journals

i. International Journal of Communication Systems. ISSN: 1074-5351.
ii. Security and Communication Networks. ISSN: 1939-0114.

iii. IET Communications. ISSN: 1751-8628.