220 CNE Course Syllabus

Course Code	220 CNE
Course Name	Data Communications
Credit Hours	3
Contact Hours	4
Instructor Name	Dr. Mahdi H A Ahmed

Text Book (title, author, and year)
• Data Communications and Networking, B. Forouzan, 5e, Mc Graw Hill, 2013. • Computer Networks, A . Tanenbaum, 5e, Pearson, 2011,

Specific Course Information	
Catalog Description	This course covers an introduction to the standards of communication systems and Networks, basics of computer networks, network protocols, different architectures of networks, and LAN design.
Prerequisites	Signals and Systems, CNE210.
Co-requisites	-
Required/Elective	required

Course Learning Outcomes	
1	To list the mathematical skills for computing and applying error detection and correction methods.
2	To describe standard protocols and layers (OSI, TCP/IP) of networks, define IP address fields and record the IP address classes.
3	To develop the student`s basic experimental skills in network topology and configuration.
4	To design and configure LAN networks for standard use.
5	To explain the importance of data communications and network systems for real applications
6	To operate network simulation tools such as Packet Tracer in order to perform required LAN network analysis, design and test.
7	To demonstrate professional team-work through mini-projects of data communications.
8	To question about new methods and protocols for data communications.

Mapping course LOs to the SLO.												
Course LOs #	Student Learning Outcomes											
	a1	a2	b1	b2	b3	b4	b5	c1	c2	c3	d1	d2
1	√											
2			√									
3				√								
4				√	√							
5						√						
6							√					
7								√				
8										√		

List of Theory Topics

Introduction: Data Communications, Network types, structure and protocol models (OSI, TCP/IP).
TCP/IP layers: Application Layer, Transport Layer
Network Layer: IP Addressing
Data Link layer (DLL): Framing and addressing, Error Detection and correction – Checksum, CRC, Hamming, Error and Flow Control (ARQ), Medium Access Control - CSMA/CD, Token Passing.
Physical Layer: Data and Signals, Media, Frequency bandwidth and channel capacity Encoding Techniques
LAN networks and Internetworking Devices

List of Lab Experiments

Exp1: Introduction (layers, devices and topologies)
Exp2: Cabling and testing of networks.
Exp3: Practical implementation of peer to peer connections.
Exp4: Practical switched connection.
Exp5: Applying IP in network devices (internet protocol)
Exp6: Introduction to packet tracer programming and skills.
Exp7: Switch and router commands for configuration
Exp8: PPP and HDLC protocols for data link layer