1. Course Number and Name: 310 CNE – Computer Networks

2. Credits and Contact Hours: 3 Credit

a. Lecture – 2 day per week at 50 minutes for 16 weeks

b. Laboratory – 1 day per week at 100 minutes for 16 weeks

3. Course Coordinator or Instructor: Dept. of CNE

4. Text Book:

- Tanenbaum, Computer Networks Latest Edition, Prentice Hall (October 7, 2010)
- James F. Kurose and Keith W. Ross, Computer Networking A Top-Down Approach Featuring the Internet, Prentice Hall (July 17, 2002).

5. Specific Course Information:

a. Catalog Description: Introductory level course on networking concepts, design and implementation. Concepts about internetworking, congestion control, packets, quality of service etc.

b. Prerequisites: 220 CNE Data Communication

c. **Status:** Required

6. Specific Goals for the Course:

a. Course Outcomes:

1. Define the concept for designing subnets, IP addressing, and outline the mathematical skills for implementing classful and classless network addressing.
2. Describe VLANs principle and advantages, and describe the standard network communication protocols such as intra-VLAN 802.1Q, and Inter VLAN routing sub-interfaces
3. Develop an ability to plan and design local area networks and troubleshoot their problems.
4. Develop an ability to conduct experiments for designing WAN and applying WAN protocols (PPP, FRAME-RELAY) for optimal connectivity
5. Explain the importance of computer networks for economic and society services and highlight the recent advances in networking design and protocols
6. Develop an ability to learn modern techniques and skills in networking for designing optimum network solutions for real life applications.
7. Demonstrate the ability to conduct a team work projects for designing and implementing a complete LAN project.
8. Demonstrate the ability to seek and obtain new protocols and technologies in computer networking.
9. Demonstrate the ability to communicate orally to describe recent advances in networking.

b. Student outcomes in Criterion 3 addressed by course:

Course LOs #	Map course LOs with the program LOs. (Place course LO #s in the left column and Student LO #s across the top.) Student Learning Outcomes Use LOs Codes											
	a1	a2	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2
1	√											
2	√											
3			√		√							
4				√								
5						√						
6							√					
7								√				
8		√								√		
9												√

7. List of Topics: 310 CNE – Computer Networks

List of Topics for Theory:

- IP Address IPV4, IPV6(Classful Addressing, Classless Addressing, Supernetting, CIDR (classless Interdomain Routing,Supernetting)
- Standard Network Architecture (Access ,Distribution, Core Layer)
- Switching(collision Domain ,Broadcast Domain, Catalyst Switch Operations)
- Redundant topology (Redundant problems), STP protocol, RSTP protocol
- VLAN's, Trunks and VTP (Local VLANs, Static VLANs, Configuring VLANs, 802.1Q Trunking, Importance of Native VLANs)
- concept of DHCP,DNS, NAT,PAT protocols
- WAN(WAN technology/terminology, WAN Devices, WAN Standards Organizations, WANs - Data Link Encapsulation)
- HDLC Encapsulation, PPP protocols, Configuring PPP)
- ISDN
- Define the ISDN standards used for addressing, concepts, and signaling
- Describe how ISDN uses the physical and data link layers
- List the interfaces and reference points for ISDN
- Frame Relay
- Identify the components of a Frame Relay network
- Explain the scope and purpose of Frame Relay
- Discuss the technology of Frame Relay
- Compare point-to-point and point-to-multipoint topologies
- Examine the topology of a Frame Relay network
- Configure a Frame Relay Permanent Virtual Circuit (PVC)
- Create a Frame Relay Map on a remote network
- Explain the issues of a non-broadcast multi-access

List of Topics for Laboratory:

- IP Addressing (class A,B,C,D,E)
- Subnet mask
- Classfull Addressing
- Subnetting/Supernetting
- Variable Length Subnet Mask
- Network design
- SWITCHING Configuration
- STP ,RSTP
- Basic VLAN Configuration(create VLAN ,switch port ,trucking)
- Inter-VLAN Routing(802.1Q Trunking ,sub interfaces)
- NAT,PAT,DHCP protocols configuration
- WAN CONNECTIONS(HDLC Configuring, PPP Configuring, Configuring Frame Relay PVC)
- IETF Frame Relay Frame, DLCI, LMI – Local Management Interface, Inverse ARP
- Frame Relay Encapsulation
- Frame Relay Configuration
- A Frame-Relay Configuration Supporting Multiple Sites