COMPUTER NETWORKS II (تقن 305)

Course Description

The course is the second in a series of courses on computer networking. It assumes familiarity with the basics of network architecture including the physical layer, the link layer, the network layer, and the transport layer. The course's topics include: an introduction the internet, the World Wide Web (WWW), and the Hypertext Transfer Protocol (HTTP), internet servers, high speed networks, optical networks, cellular networks, fixed infrastructure networks, multicast, intranet and internet routing protocols, comparison between distance vector and link state routing mechanisms, encryption, and resource reservation. Protocols for the above topics will be discussed along with their properties and ways to improve them the course's topics will be divided roughly into three sections: transport layer issues (inter-network routing, congestion control and avoidance).

Course Objective

1. This module aims to provide a broad coverage of some new advanced topics in the field of computer networks (wireless networks, mobile networks, VPN networks, Mobile IP, etc.)
2. Practical aspects of the Ethernet, Wi-Fi and the TCP/IP will be discussed in more details. The goal of this course is to give the background information help the better understanding of the practical Computer Network related problems.
3. The main goal here is answering the questions like "what is the problem", "why it is a problem", "how we can solve it" and "what else we can do".
4. Will be able to understand concepts of the Advance Computer Networks

References

Required:

1. High-Speed Networks and Internets, Performance and Quality of Service by William Stallings
2. CCNA Intro – Study Guide – Todd Lammle, Sybex

Recommended:

1. Andrew S. Tanenbaum (2010). Computer Networks (5th edition). Prentice Hall.

Prerequisite: Computer Network I (202 تقن)

Evaluation Method:

- 40 % : Final Examination
- 20% Mid-term 1
- 20% Mid-term 2
- 10% Practical in lab
- 5% Class performance/Participation.
- 5% Assignments/Quiz

Weeks	**Topic Name**	***Sub Topic***	*Reading Chapter*
Week 1	**Introduction**	Network overview Type of network Data communication	
Week 2	**Optical Networking**	Introduction to Optical Networking SONET / SDH Standard DWDM	
Week 3	**ATM: The WAN Protocol**	Introducing ATM Technology Introducing Faces of ATM Explaining the basic concepts of ATM Networking Exploring the B-ISDN reference model Explaining the Physical Layer. Explaining the ATM Layer Explaining the ATM Adaptation Layer Exploring ATM Physical	

Weeks	Topic Name	*Sub Topic*	*Reading Chapter*
		interface Choosing an Appropriate ATM Public Service	
Week 4	**Packet Switching Protocols**	Introduction to Packet Switching, Introduction to Virtual Circuit Packet, Switching Introduction to X.25,Introducing switched multimegabit data service	
Week 5	**Protocols and Interfaces in Upper Layers of TCP/IP**	Introducing TCP/IP suite Explaining Network Layer Protocols How do routers use next-hop addresses to select a path for packets to reach their destination? Explaining Transport Layer Protocol Explaining Application Layer Protocol	
Week 6	**Routing in the Internet**	Introduction to traffic Engineering IP over ATM..	
	Mid-term 1		
Week 7	**Layer 2 Switching and EIGRP**	Enhance Interior gateway routing protocol. And Storage Area Network? Before Layer 2 Switching Switching Services Spanning Tree Protocol (STP) LAN Switch-Types	

Weeks	Topic Name	*Sub Topic*	*Reading Chapter*
Week 8	**Other Routing Techniques**	OSPF, CIDR	
Week 9	**Network Management and Services**	Introduction to Network Management Standard Network Management Protocol	
Week 10	**Traffic Engineering Basics**	Introduction to traffic Engineering Requirement Definition for Traffic Engineering Traffic Sizing Traffic Characteristics Protocols Time and Delay Consideration Connectivity Availability, Reliability, and Maintainability Throughput Calculation	
Week 11	**Multimedia over Internet**	Introduction to Multimedia Services Explaining Transmission of Multimedia over the Internet Explaining IP Multicasting Explaining VOI	
	<u>Mid-term 2</u>		
Week 12	**Introduction to the Cisco IOS**	The Cisco Router User Interface Command Line Interface (CLI) Router and Switch	

Weeks	Topic Name	*Sub Topic*	*Reading Chapter*
		Administrative Functions Router Interfaces Viewing, Saving, and Erasing Configurations	
Week 13	**IP Routing IPv4 & 6**	Routing Basics The IP Routing Process Configuration IP Routing in Our Network	
Week 14	**Dynamic Routing Protocols**	Routing Protocol Basics Routing Information Protocol (RIP) Interior Gateway Routing Protocol (IGRP) Verifying Your Configurations	