School of Computing and Information Sciences

Course Title: Applied Computer Networking **Date:** 11/2/2005

Course Number: CGS 4285

Number of Credits: 3

Subject Area: Networking	**Subject Area Coordinator:** Nagarajan Prabakar **email:** prabu@cs.fiu.edu
Catalog Description: Principles of computer network design, operation and management. Topics include network protocols, network configuration and network security.	
Textbook: Networking with TCP/IP Comer ISBN 013-187671-6	
References:	
Prerequisites Courses:	
Corequisites Courses:	

Type: Required

Prerequisites Topics:

1. Discrete Math
2. Basic programming

Course Outcomes:

1. Master ethernet hardware and cableing
2. Master ethernet link layer operation
3. Master techniques for design of IPv4 networks, addressing and subneting
4. Master documentation methods for networks.
5. Be familiar with troubleshooting tools and techniques for ethernet networks
6. Be familiar with OSI network model
7. Be familiar with IPv4 protocols (tcp/udp/icmp) and their uses
8. Be familiar with troubleshooting tools for IP networks
9. Be familiar with Network Address Translation (NAT) and its use
10. Be exposed to IP routing and IP routing protocols
11. Be exposed to network support applications (DNS/DHCP)
12. Be exposed to network security, firewalls, VPN's
13. Be exposed to WAN technologies, wireless, IP Multicast

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Outline

Topic	Number of Lecture Hours	Outcome
• OSI Model, networking basics	1	6
• Ethernet o Media o Topologies o Link Layer o Building cables o VLANS	4	1,2,5
• IPv4 o Addressing o Routing model o Fragmentation o ARP o ICMP o TCP/UDP o Network Design	5	3,7,8,10
• Network support applications o DHCP o DNS	2	11
• Documenting Networks o Physical Diagrams (Layer 2) o Logical Diagrams (Layer 3) o Text documentation	2	3,4,10
• Introduction to advanced topics o WAN technologies o Multicast o Wireless networking o IPV6	2.5	13
• Network security o VPN's o Firewalls o NAT	2	9,12

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Course Outcomes Emphasized in Laboratory Projects / Assignments

	Outcome	Number of Classes
1	Building Cat5 ethernet cables Outcome: 1	1
2	Using ethereal to debug networks Outcomes: 5,8	1
3	Basic IP routing and ICMP Outcomes: 3,5,7,8	1
4	NAT function and operation Outcomes: 5,8,9	1
5	Documenting Networks Outcomes: 4	3

Oral and Written Communication:

Number of written reports: 6

Approximate number of pages for each report: 3

Number of required oral presentations: 0

Approximate time for each presentation: 0

Social and Ethical Implications of Computing Topics

Topic	Class time	Student performance measures
Security	1	none

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Theoretical Contents

Topic	Class time
OSI model	1
Network design	3

Problem Analysis Experiences

1.	Network debugging - 4 labs

Solution Design Experiences

1.	Network Design – 1 homework and 1 project