

## School of Computing and Information Sciences

**Course Title:** Advanced Network Management

**Date:** 8/30/10

**Course Number:** CNT- 4504

**Number of Credits:** 3

<b>Subject Area:</b> Networking	<b>Subject Area Coordinator:</b> Nagarajan Prabakar <b>email:</b> prabakar@cis.fiu.edu
<b>Catalog Description:</b> Advanced principles of modern internetworking network design and implementation. Hands on experience with routers and switches and core Internet support protocols.	
<b>Textbook:</b> Computer Networks and Internets by Douglas Comer. ISBN: 0-13-143351-2	
<b>References:</b>	
<b>Prerequisites Courses:</b> CNT4513	
<b>Corequisites Courses:</b> None	

**Type:** Elective

**Prerequisites Topics:**

- Basic Unix skills
- Ethernet
- Ipv4 operation and routing

**Course Outcomes:**

1. Master TCP/IP version 4 addressing and network design
2. Master modern network infrastructure support systems (DNS, DHCP, NTP, syslog)
3. Master network issue debugging techniques with tools such as Ethereal and tcpdump
4. Master installation and configuration of multiple vendors routing equipment
5. Be familiar with modern ethernet systems, including spanning tree and 802.1q VLANS
6. Be familiar with modern routing protocols (BGP, OSPF)
7. Be familiar with IPv6 addressing and network design
8. Be familiar with SNMP protocol and its uses in managing and monitoring networks.
9. Be familiar with Stateless IP firewalling concepts and commands

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**Relationship between Course Outcomes and Program Outcomes**

<b>BS in IT: Program Outcomes</b>	<b>Course Outcomes</b>
a) Demonstrate practical hands-on expertise in selection, installation, customizing and maintenance of the state-of-the-art computing infrastructure.	1,2,3,4,5,6,7,8,9
b) Demonstrate practical proficiency in selection, installation, customizing and maintenance of the state-of-the-art software systems.	2,3,8,9
c) Demonstrate general understanding of at least one field where Information Technology plays a central role.	1,2,4,5,6,7
d) Demonstrate understanding of the social and ethical concerns of the practice of Information Technology.	9
e) Demonstrate the ability to work cooperatively in teams.	1,2,4,5,6
f) Demonstrate effective communication skills.	1,3,4
g) Demonstrate familiarity with fundamental ideas and issues in the arts, humanities and social sciences.	9

**Assessment Plan for the Course & how Data in the Course are used to assess Program Outcomes**

Student and Instructor Course Outcome Surveys are administered at the conclusion of each offering, and are evaluated as described in the School's Assessment Plan:  
<http://www.cis.fiu.edu/programs/undergrad/it/assessment/>

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**Outline**

<b>Topic</b>	<b>Number of Lecture Hours</b>	<b>Outcome</b>
Network Design	2	1
Router operation and configuration	3	1,3,4
Static IP routing	1	1,3,4
Network support applications	3	1,2,3,4
Interior Routing Protocols	2	1,3,4,6
Exterior Routing Protocols	3	1,3,4,6
Advanced Switching, Spanning Tree ,VLANs, VRRP	4	1,3,4,5
Firewalls	2	1,3,4,9
SNMP	2	1,3,4,8
Ipv6	2	1,3,4,7

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**Course Outcomes Emphasized in Laboratory Projects / Assignments**

	<b>Outcome</b>	<b>Number of Classes</b>
1	Basic Router Configuration Outcome 1,3,4	1
2	Static routing	1
3	Network Support Applications	2
4	Internal routing protocols	1
5	Exterior routing protocols	2
6	Switching/VLANs/VRRP	2
7	Firewalls	1
8	SNMP	1
9	Ipv6	1

**Oral and Written Communication:**

Number of written reports: 9

Approximate number of pages for each report: 5

Number of required oral presentations: 0

Approximate time for each presentation: 0

**Social and Ethical Implications of Computing Topics**

1	Computer and network security – 1 class
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**Estimate Curriculum Category Content (credit hours)**

<b>Fundamental ITArea</b>	<b>Core</b>	<b>Advanced</b>
Human computer interaction		
Information management		
Web systems and technologies		
System administration and maintenance		0.5
Programming		
Networking		1.5
Information assurance and security		0.2
System integration and architecture		0.8

**Theoretical Contents**

1	Network design concepts – 2 classes

**Problem Analysis Experiences**

1	9 labs as outlined above
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**Solution Design Experiences**

1	Design/Engineering of networks
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