

SYLLABUS

DATE OF LAST REVIEW:	02/2013
CIP CODE:	11.0901
SEMESTER:	Spring 2011
COURSE TITLE:	Networking IV
COURSE NUMBER:	CIST0250
CREDIT HOURS:	4
INSTRUCTOR:	Departmental Syllabus
OFFICE LOCATION:	Departmental Syllabus
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PREREQUISITES:	CIST-0216 Networking III

REQUIRED TEXT AND MATERIALS:

Please check with the KCKCC bookstore, <http://www.kckccbookstore.com> for the required text for your particular class.

COURSE DESCRIPTION:

This is the fourth of four semester courses designed to provide students with classroom and laboratory experience in current and emerging networking technology that will empower them to enter employment and/or further education and training in the computer networking field. Topics that will be covered include wide area networks (WAN), WAN design, point to point protocol (PPP), integrated services digital network (ISDN), frame relay, and advanced network management. Students will complete their design and documentation of a hypothetical network. This class uses the Cisco Academy Material, CCNA semester 4.

METHOD OF INSTRUCTION:

A variety of instructional methods may be used depending on content area. These include but are not limited to: lecture, multimedia, cooperative/collaborative learning, labs and demonstrations, projects and presentations, speeches, debates, and panels, conferencing, performances, and learning experiences outside the classroom including using the internet. Methodology will be selected to best meet student needs.

COURSE OUTLINE:

- I. Course Introduction
 - A. Introduction to WANS
 - B. Providing Integrated Services to the Enterprise

- C. WAN Technology Concepts
- D. WAN Connection Options
- E. Chapter Labs
- II. PPP
 - A. Serial Point-to-Point Links
 - B. PPP Concepts
 - C. Configuration Options
 - D. Configuring PPP with Authentication
 - E. Chapter Labs
- III. Frame Relay
 - A. Basic Frame Relay Concepts
 - B. Configuring Frame Relay
 - C. Advanced Frame Relay Concepts
 - D. Configuring Advanced Frame Relay
 - E. Chapter Labs
- IV. Network Security
 - A. Introduction to Network Security
 - B. Securing Cisco Routers
 - C. Secure Router Network Services
 - D. Using Cisco SDM
 - E. Secure Router Management
 - F. Chapter Labs
- V. ACLs
 - A. Using ACLs to Secure Networks
 - B. Configuring Standard ACLs
 - C. Configuring Extended ACLs
 - D. Configure Complex ACLs
 - E. Chapter Labs
- VI. Teleworker Services
 - A. Business Requirements for Teleworker Services
 - B. Broadband Services
 - C. VPN Technology
- VII. IP Addressing Services
 - A. DHCP
 - B. Scaling Networks with NAT
 - C. IPv6
 - D. Chapter Labs
- VIII. Network Troubleshooting
 - A. Establishing the Network Performance Baseline
 - B. Troubleshooting Methodologies and Tools
 - C. Common WAN Implementation Issues
 - D. Interpreting Network Diagrams to Identify Problems
 - E. Chapter Labs

EXPECTED LEARNER OUTCOMES:

- A. The student will be able to explain a variety of WAN Technologies functions.
- B. The student will be able to set up Point-to-Point Protocol (PPP) WAN links.
- C. The student will be able to set up Frame Relay WAN Protocol.
- D. The student will be able to demonstrate the use of Network Security standards.
- E. The student will be able to use ACLs to filter network traffic.
- F. The student will be able to explain techniques used by teleworkers.
- G. The student will be able to set up DHCP addressing in a network.
- H. The student will be able to troubleshoot problems in a network using best practices.

- I. The student will be able to use employability techniques.

COURSE COMPETENCIES:

The student will be able to explain a variety of WAN Technologies functions.

1. The student will be able to describe how the Cisco enterprise architecture provides integrated services over an enterprise network.
2. The student will be able to describe key WAN technology concepts.
3. The student will be able to select the appropriate WAN technology to meet different enterprise business requirements.

The student will be able to set up Point-to-Point Protocol (PPP) WAN links.

4. The student will be able to describe the fundamental concepts of point-to-point serial communication.
5. The student will be able to describe key PPP concepts.
6. The student will be able to configure PPP encapsulation.
7. The student will be able to explain and configure PAP and CHAP authentication.

The student will be able to set up Frame Relay WAN Protocol.

8. The student will be able to describe the fundamental concepts of Frame Relay technology in terms of enterprise WAN services, including operation, implementation requirements, maps, and The student will be able to Local Management Interface (LMI) operation.
9. The student will be able to configure a basic Frame Relay permanent virtual circuit (PVC), including configuring and troubleshooting Frame Relay on a router serial interface and configuring a static Frame Relay map.
10. The student will be able to describe advanced concepts of Frame Relay technology in terms of enterprise WAN services, including subinterfaces, bandwidth, and flow control.
11. The student will be able to configure an advanced Frame Relay PVC, including solving reachability issues, configuring subinterfaces, and verifying and troubleshooting a Frame Relay configuration.

The student will be able to demonstrate the use of Network Security standards.

12. The student will be able to identify security threats to enterprise networks.
13. The student will be able to describe methods to mitigate security threats to enterprise networks
14. The student will be able to configure basic router security.
15. The student will be able to disable unused router services and interfaces.
16. The student will be able to use the Cisco SDM one-step lockdown feature.
17. The student will be able to manage files and software images with the Cisco IOS Integrated File System (IFS).

The student will be able to use ACLs to filter network traffic.

18. The student will be able to explain how ACLs are used to secure a medium-size enterprise branch office network, including the concept of packet filtering, the purpose of ACLs, how ACLs are used to control access, and the types of Cisco ACLs.
19. The student will be able to configure standard ACLs in a medium-size enterprise branch office network, including defining filtering criteria, configuring standard ACLs to filter traffic, and applying standard ACLs to router interfaces.
20. The student will be able to configure extended ACLs in a medium-size enterprise branch office network, including configuring extended ACLs and named ACLs, configuring filters, verifying and monitoring ACLs, and troubleshooting extended ACL issues.
21. The student will be able to describe complex ACLs in a medium-size enterprise branch office network, including configuring dynamic, reflexive, and timed ACLs, verifying and troubleshooting complex ACLs, and explaining relevant caveats.

The student will be able to explain techniques used by teleworkers.

22. The student will be able to describe the enterprise requirements for providing teleworker services, including the differences between private and public network infrastructures.
23. The student will be able to describe the teleworker requirements and recommended architecture for providing teleworking services.
24. The student will be able to explain how broadband services extend enterprise networks using DSL, cable, and wireless technology.
25. The student will be able to describe the importance of VPN technology, including its role and benefits for enterprises and teleworkers.
26. The student will be able to describe how VPN technology can be used to provide secure teleworker services to an enterprise network.

The student will be able to set up DHCP addressing in a network.

27. The student will be able to configure DHCP in an Enterprise branch network. This includes being able to explain DHCP features and benefits, the differences between BOOTP and DHCP, DHCP operation: and configuring, verifying, and troubleshooting DHCP.
28. The student will be able to configure NAT on a Cisco router. This includes explaining key features and operation of NAT and NAT Overload, explaining advantages and disadvantages of NAT, configuring NAT and NAT Overload to conserve IP address space in a network, configuring port forwarding, and verifying and troubleshooting NAT configurations.
29. The student will be able to configure new generation RIP (RIPng) to use IPv6. This includes explaining how IPv6 solves any problem of IP address deletion, explaining how to assign IPv6 addresses, describing transition strategies for implementing IPv6 and configuring, verifying and troubleshooting RIPng for IPv6.

The student will be able to troubleshoot problems in a network using best practices.

30. The student will be able to establish and document a network baseline.
31. The student will be able to describe the various troubleshooting methodologies and troubleshooting tools.
32. The student will be able to describe the common issues that occur during WAN implementation.
33. The student will be able to identify and troubleshoot common enterprise network implementation issues using a layered model approach.

The student will be able to use employability techniques.

34. The student will be able to meet deadlines.

ASSESSMENT OF LEARNER OUTCOMES:

Student progress is evaluated by means that include, but are not limited to, exams, written assignments, and class participation.

SPECIAL NOTES:

This syllabus is subject to change at the discretion of the instructor. Material included is intended to provide an outline of the course and rules that the instructor will adhere to in evaluating the student's progress. However, this syllabus is not intended to be a legal contract. Questions regarding the syllabus are welcome any time.

Kansas City Kansas Community College is committed to an appreciation of diversity with respect for the differences among the diverse groups comprising our students, faculty, and staff that is free of bigotry and discrimination. Kansas City Kansas Community College is committed to providing a multicultural education and environment that reflects and respects diversity and that seeks to increase understanding.

Kansas City Kansas Community College offers equal educational opportunity to all students as well as serving as an equal opportunity employer for all personnel. Various laws, including Title IX of the Educational

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All enrolled students at Kansas City Kansas Community College are subject to follow all rules, conditions, policies and procedures as described in both the Student Code of Conduct as well as the Student Handbook. All Students are expected to review both of these documents and to understand their responsibilities with regard to academic conduct and policies. The Student Code of Conduct and the Student Handbook can be found on the KCKCC website.