ILLINOIS VALLEY COMMUNITY COLLEGE

COURSE OUTLINE

DIVISION: **Workforce Development**

COURSE: **CSN 1234; Securing and Analyzing TCP/IP Networks**

Date: Spring 2014

Credit Hours: 3

Prerequisite(s):   CSN 1225 and CSN 1230

Delivery Method: ☒ **Lecture**   **2 Contact Hours** (1 contact = 1 credit hour)

☐ **Seminar**   **0 Contact Hours** (1 contact = 1 credit hour)

☒ **Lab**   **2 Contact Hours** (2 contact = 1 credit hour)

☐ **Clinical**   **0 Contact Hours** (3 contact = 1 credit hour)

☐ **Online**

☐ **Blended**

Offered: ☒ **Fall**   ☐Spring   ☐ **Summer**

IAI Equivalent –*Only for Transfer Courses*-go to *http://www.itransfer.org*:

CATALOG DESCRIPTION:
Students will learn how to implement and support TCP/IP in local and wide area network environments. Various TCP/IP utilities and commands will be covered. Topics will include setting up, configuring, testing, and optimizing a TCP/IP server. This course is intended for network administrators.

GENERAL EDUCATION GOALS ADDRESSED
[See the last page of this form for more information.]
Upon completion of the course, the student will be able:
[Choose those goals that apply to this course.]

☐ To apply analytical and problem solving skills to personal, social and
 professional issues and situations.

☐ To communicate orally and in writing, socially and interpersonally.

☐ To develop an awareness of the contributions made to civilization by
 the diverse cultures of the world.

☐ To understand and use contemporary technology effectively and to
 understand its impact on the individual and society.

☐ To work and study effectively both individually and in collaboration with
 others.

☐ To understand what it means to act ethically and responsibly as an
 individual in one's career and as a member of society.

☐ To develop and maintain a healthy lifestyle physically, mentally, and
 spiritually.

☐ To appreciate the ongoing values of learning, self-improvement, and
 career planning.

EXPECTED LEARNING OUTCOMES AND RELATED COMPETENCIES:
[Outcomes related to course specific goals.]
Upon completion of the course, the student will be able to:
1. install and configure TCP/IP on a Microsoft workstation
2. use various TCP/IP utilities to troubleshoot a network.
3. learn about IP addressing and resolving local and remote IP addresses.
4. learn about subnetting and will be able to define host ID's for a subnet.
5. learn the basic concepts involved with static and dynamic IP routing
6. install and configure a DHCP server.
7. install a WINS proxy and configure a DHCP server for WINS.
8. learn how DNS works and how to plan a DNS implementation.
9. Learn various application utilities that work at the application layer of the OSI model in conjunction with TCP/IP.
10. Learn how to implement Microsoft SNMP services.

Outcome 1 – Upon completion of the course, the student will be able to install and configure TCP/IP on a Microsoft workstation.
 Competency 1.1 – the student will be able to use Network Neighborhood to install the TCP/IP protocol.
 Competency 1.2 – the student will be able to use the IPCONFIG utility to retrieve information about the TCP/IP protocol install and the NIC board associated with it.
 Competency 1.3 – the student will be able to use the PING utility to "see" other students' computers on the network.
 Competency 1.4 – the student will know the architectural structure of the TCP/IP protocol suite.
Outcome 2 – Upon completion of the course, the student will be able to use various TCP/IP utilities to troubleshoot a network.
 Competency 2.1 – the student will be able to determine the syntax of the commands.

Competency 2.2 – the student will be able to download and use various freeware-troubleshooting utilities from the Internet.

Outcome 3 – Upon completion of the course, the student will be able to learn about IP addressing and resolving local and remote IP addresses.

Competency 3.1 – the student will be able to identify the in detail how protocols at each layer of the OSI model work with the other protocols at other layers.

Competency 3.2 – the student will be able to view and modify the ARP cache.

Competency 3.3 – the student will be able to view packet activity with Network monitor.

Outcome 4 – Upon completion of the course, the student will learn about subnetting and will be able to define host ID's for a subnet.

Competency 4.1 – the student will be able to identify the historical IP classes and their intended use.

Competency 4.2 – the student will know the procedure to apply for IP addresses for his/her company's use.

Competency 4.3 – the student will be able to indentify valid and invalid IP addresses.

Competency 4.5 – the student will learn how to assign IP addresses to multiple TCP/IP networks with a single network ID.

Competency 4.6 – the student will learn when subnetting is necessary and will set up default and custom subnet masks with a range of valid IP addresses for each subnet.

Outcome 5 – Upon completion of the course, the student will learn the basic concepts involved with static and dynamic IP routing.

Competency 5.1 – the student will learn the basic concepts of routing – why and when it is necessary.

Competency 5.2 – the student will be able to build a static routing table and use the ROUTE utility to add static routes to the route table.

Competency 5.3 – the student will be able to configure a workstation to function as an IP router and detect default gateway failure.

Outcome 6 – Upon successful completion of the course, the student will install and configure a DHCP server.

Competency 6.1 – the student will learn about the DHCP and how it can be automatically configured to eliminate some common configuration problems.

Competency 6.2 – The student will install and configure a DHCP server and test that configuration.

Competency 6.3 – the student will install a DHCP relay agent and then obtain an IP address from the DHCP server.

Outcome 7 – Upon successful completion of the course, the student will install a WINS proxy and configure a DHCP server for WINS.

Competency 7.1 – the student will apply knowledge from Outcome 6 along with knowledge from the prerequisite course, CSN 1225, to use WINS with DHCP and NetBIOS.

Competency 7.2 – the student will learn how to administer a WINS environment.

Competency 7.3 – the student will configure a push and pull partner.

Outcome 8 – Upon successful completion of the course, the student will learn how DNS works and how to plan a DNS implementation.

Competency 8.1 – the student will learn the structure and components of the DNS.

Competency 8.2 – the student will learn how to configure DNS files and how to register a DNS server with the parent domain.

Competency 8.3 – the student will design a DNS for various scenarios and make decisions about the number of domains, name servers, zones and associated DNS files.

Outcome 9 – Upon successful completion of the course, the student will learn various application utilities that work at the application layer of the OSI model in conjunction with TCP/IP.

Competency 9.1 – the student will learn about attaching to and transferring files from computers of all different operating system environments.

Competency 9.2 – the student will use FTP to transfer files between computers.

Competency 9.3 – the student will use a web browser to access the Internet.

Competency 9.4 – the student will use TELNET to sign on to a remote server.

Competency 9.5 – the student will learn about LPD to set up and manipulate printers.

Outcome 10 – Upon successful completion of the course, the student will learn how to implement Microsoft SNMP services.

Competency 10.1 – the student will learn the basic concepts behind the SNMP protocol.

Competency 10.2 – the student will install, configure, and test the SNMP service.

COURSE TOPICS AND CONTENT REQUIREMENTS:

Introduction to TCP/IP, its History, and Standards
Installing and Configuring TCP/IP
Architectural Overview of the TCP/IP Protocol Suite
IP Addressing
Subnetting
Implementing IP routing
The Dynamic Host Configuration Protocol (DHCP)
NetBIOS over TCP/IP
Windows Internet Name Service (WINS)
IP Internetwork Browsing and Domain Functions
Host Name Resolution
Implementing Domain Name System (DNS)
Connectivity in Heterogeneous Environments
Implementing SNMP Services
Troubleshooting TCP/IP

INSTRUCTIONAL METHODS:

Classroom lecture and demonstration
Student hands-on lab exercises

INSTRUCTIONAL MATERIALS:

"Guide to TCP/IP, Fourth Edition by Jeffrey Carrell, Laura A Chappell, Ed Tittel, and James Pyles
Wireshark software

STUDENT REQUIREMENTS AND METHODS OF EVALUATION:
Students will complete all assigned hands-on activities.
Students will complete and turn in all application assignments.
Students will complete quizzes on the topics discussed.
Students will successfully complete two – three written and hands-on exams

  90 – 100 = A
  80 – 89 = B
  70 – 79 = C
  60 – 69 = D

OTHER REFERENCES

Course Competency/Assessment Methods Matrix

CSN 1234; TCP/IP	Assessment Options																														
Assessment Measures – Are direct or indirect as indicated. List competencies/outcomes below.	**Assessment of Student Learning** (Direct/Indirect)	Article Review	Case Studies	Group Projects	Lab Work	Oral Presentations	Pre-Post Tests	Quizzes	Written Exams	Artifact Self Reflection of Growth	Capstone Projects	Comprehensive Written Exit Exam	Course Embedded Questions	Multi-Media Projects	Observation	Writing Samples	Portfolio Evaluation	Real World Projects	Reflective Journals	Applied Application (skills) Test	Oral Exit Interviews	Accreditation Reviews/Reports	Advisory Council Feedback	Employer Surveys	Graduate Surveys	Internship/Practicum /Site Supervisor Evaluation	Licensing Exam	In Class Feedback	Simulation	Interview	Written Report	Assignment
		D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	I	I	I	I	D	D						
Outcome 1 – Upon completion of the course, the student will be able to understand the TCP/IP history and layered approach			X	X	X			X	X						X													X				X
Outcome 2 – Upon completion of the course, the student will be able to use various TCP/IP utilities to troubleshoot a network.			X	X	X			X	X																			X				X
Outcome 3 – Upon completion of the course, the student will be able to learn about IP addressing and resolving local and remote IP addresses.			X	X	X			X	X																			X				X
Outcome 4 – Upon completion of the course, the student will learn various application utilities that work at the application layer of the OSI model in conjunction with TCP/IP.			X		X	X		X	X																			X			X	X
Outcome 5 – Upon completion of the course, the student will be able to troubleshoot networks based on network packet trace.					X																							X				X

For each competency/outcome place an "X" below the method of assessment to be used.