

JOLIET JUNIOR COLLEGE
DEPARTMENT OF COMPUTER INFORMATION
AND OFFICE SYSTEMS

COURSE SYLLABUS

Course Prefix and Number	CNT 101
Course Title	Network Fundamentals
Curriculum	Computer Information Systems
Semester Hours	4
Lecture	4
Lab	0
Prerequisites:	None

Catalog Description

This course is the first of four classes approved by Cisco Systems Inc., which prepares students for the Cisco Certified Network Associate (CCNA) exam. Content covers the study of devices and protocols used to connect computers and support devices into a network. Describe how the TCP/IP Layer protocols provide the services specified by the upper layers of the OSI model. Explain the structure of IP addressing. Also covered are media design, structured cabling, and network management.

Course Objectives: See attached

Prepared by:

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4/00

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Updated 12/00

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Department Chairperson

Date

STUDENT MATERIALS

A. Textbook:

Title: CCNA Portable Command Guide, 2nd Ed.

Author:

Publisher: Cisco Press (Prentice Hall)

OPTIONAL

Title: Network Fundamentals, CCNA Exploration Companion Guide (ISBN: 1587132087 / ISBN 13: 9781587132087)

Author: Mark Dye (Author), Rick McDonald (Author), Antoon Ruffi (Author)

Publisher: Cisco Press - Prentice Hall

B. Other Required Materials

Student Evaluation (Type of Grading)

Cabling a simple LAN, a journal, 15 online exams and an online final exam.

	<p>Explain the key functions of the Transport layer, including reliability, port addressing, and segmentation. Explain how TCP and UDP each handle key functions. Identify when it is appropriate to use TCP or UDP and provide examples of applications that use each protocol.</p>	
7-8	<p>OSI Network Layer</p> <p>Identify the role of the Network layer as it describes communication from one end device to another end device. Examine the most common Network layer protocol, Internet Protocol (IP), and its features for providing connectionless and best-effort service. Understand the principles used to guide the division, or grouping, of devices into networks. Understand the hierarchical addressing of devices and how this allows communication between networks. Understand the fundamentals of routes, next-hop addresses, and packet forwarding to a destination network. Addressing the Network IPv4 Explain the structure IP addressing and demonstrate the ability to convert between 8-bit binary and decimal numbers. Given an IPv4 address, classify by type and describe how it is used in the network. Explain how addresses are assigned to networks by ISPs and within networks by administrators. Determine the network portion of the host address and explain the role of the subnet mask in dividing networks. Given IPv4 addressing information and design criteria, calculate the appropriate addressing components. Use common testing utilities to verify and test network connectivity and operational status of the IP protocol stack on a host.</p>	
9-10	<p>Data Link Layer</p> <p>Explain the role of Data Link layer protocols in data transmission. Describe how the Data Link layer prepares data for transmission on network media. Describe the different types of media access control methods. Identify several common logical network topologies and describe how the logical topology determines the media access control method for that network. Explain the purpose of encapsulating packets into frames to facilitate media access. Describe the Layer 2 frame structure and identify generic fields. Explain the role of key frame header and trailer fields, including addressing, QoS, type of protocol, and Frame Check Sequence.</p> <p>OSI Physical Layer</p> <p>Explain the role of Physical layer protocols and services in supporting communication across data networks. Describe the purpose of Physical layer signaling and encoding as they are used in networks. Describe the role of signals used to represent bits as a frame is</p>	

	transported across the local media.	
11-12	<p>Ethernet</p> <p>Describe the evolution of Ethernet</p> <p>Explain the fields of the Ethernet Frame</p> <p>Describe the function and characteristics of the media access control method used by Ethernet protocol</p> <p>Describe the Physical and Data Link layer features of Ethernet</p> <p>Compare and contrast Ethernet hubs and switches</p> <p>Explain the Address Resolution Protocol (ARP)</p>	
13-14	<p>Identify the basic network media required to make a LAN connection.</p> <p>Identify the types of connections for intermediate and end device connections in a LAN.</p> <p>Identify the pinout configurations for straight-through and crossover cables.</p> <p>Identify the different cabling types, standards, and ports used for WAN connections.</p> <p>Define the role of device management connections when using Cisco equipment.</p> <p>Design an addressing scheme for an internetwork and assign ranges for hosts, network devices, and the router interface.</p> <p>Compare and contrast the importance of network designs.</p>	
15	<p>Define the role of the Internetwork Operating System (IOS).</p> <p>Define the purpose of a configuration file.</p> <p>Identify several classes of devices that have the IOS embedded.</p> <p>Identify the factors contributing to the set of IOS commands available to a device.</p> <p>Identify the IOS modes of operation.</p> <p>Identify the basic IOS commands.</p> <p>Compare and contrast the basic show commands.</p>	

FORM C, PART II

OBJECTIVES

Upon completion of the course, the student will be able to:

1. Master Basic Content: OSI Model, Internetworking Devices, IP Addressing, LAN Media & Topologies, Structured Cabling, Electronics.
2. Master Lab Skills: Patch cables, Simple LAN, Use of test equipment.
3. Master Documentation Skills: Maintain Engineering Journal.