Course Outline for CNT 62A

CISCO NETWORKING ACADEMY CCNA I

Effective: Fall 2014

I. CATALOG DESCRIPTION:
   CNT 62A — CISCO NETWORKING ACADEMY CCNA I — 4.00 units

   This course covers the first half of the CCNA Cisco Certified Network Associate Certification curriculum, and the objectives of the Cisco CCENT certification exam. CNT62B covers the second half. CNT62A will cover the fundamentals of networking, including the OSI model and industry standards, concepts, network topologies, cabling, network hardware, basic network design, LANs, and network configuration and troubleshooting. It includes router and routing concepts and terminology including OSPF, RIP, EIGRP routing protocols, distance vector and link state routing, routing loop issues, routing theory, TCP/IP basics, IP v4 and v6 addressing, VLSM, CIDR, subnetting, router IOS and configuration, switching concepts, CDP and CSMA-CD. Students will get hands-on experience configuring Cisco routers and switches. Students should have strong basic computer skills and knowledge of Internet use.

   3.00 Units Lecture 1.00 Units Lab

   Strongly Recommended
   CIS 50 - Intro to Computing Info Tech

   Grading Methods:
   Letter or P/NP

   Discipline:

	MIN
Lecture Hours:	54.00
Lab Hours:	54.00
Total Hours:	108.00

II. NUMBER OF TIMES COURSE MAY BE TAKEN FOR CREDIT: 1

III. PREREQUISITE AND/OR ADVISORY SKILLS:

   Before entering this course, it is strongly recommended that the student should be able to:

   A. CIS50

IV. MEASURABLE OBJECTIVES:
   Upon completion of this course, the student should be able to:

   A. classify types of networks, network hardware and software;
   B. compare classes of IP addressing and the use of subnet masks;
   C. describe the characteristics of Ethernet, token ring, and bus topologies;
   D. identify and describe the seven layers of the OSI model
   E. contrast the components of the TCP/IP protocol suite;
   F. describe Local Area Network (LAN) protocols;
   G. evaluate the use of hubs, repeaters, switches and bridges;
   H. formulate router configurations using IP addressing and subnets;
   I. describe and compare Distance-Vector and Link State protocols;
   J. demonstrate the use of the USER and PRIVILEGED mode commands;
   K. contrast RAM, Flash memory, NVRAM, and ROM;
   L. compare types of network media, their advantages and disadvantages;
   M. assemble and configure routers and hosts in a basic LAN;
   N. demonstrate organized troubleshooting skills for LAN systems

V. CONTENT:
   A. Network computing basics
      1. Software & hardware basics
      2. Basic networking technology
      3. Binary, decimal and hexadecimal number systems
   B. The OSI model
      1. A general model of network communications
      2. Communications protocols and operation at each layer

3. The OSI model compared with the TCP/IP (DOD) model
C. Local area networks (LAN)
    1. LAN devices
    2. Protocols and operations
    3. Configuration, operation, testing
    4. LAN design methods, tools and skills
D. Electronics and Signaling
    1. Electronic concepts
    2. Signaling measurement and operation
    3. Signals and noise in communication systems
E. Media, Concepts and Technologies
    1. Media types, specifications, termination, and testing
    2. Deterministic and non-deterministic networks
    3. Star, bus, and ring topologies
    4. 802.3
    5. CSMA-CD
F. Structured cabling design and Documentation
    1. Basic network design and documentation
    2. Project planning and standards and specifications
    3. Equipment for testing structures cabling projects
    4. Installation of structured cable runs, wiring closets and patch panels
    5. Horizontal and backbone cabling, power and grounding
    6. Surge suppressors and UPS functions
    7. Cabling troubleshooting methods, tools and skills
G. Routers
    1. Router components
    2. Router operational concepts
    3. Command line user interface, CLI
    4. Configuration and interface modes
    5. CCNA level commands and arguments
    6. IOS images, configuration and methods
    7. Router configuration troubleshooting methods, tools and skills
H. Switches
    1. Switch components
    2. Switching concepts
    3. Command line user interface
    4. Configuration and interface modes
    5. CCNA level commands and arguments
    6. IOS images, configuration and methods
    7. Switching troubleshooting methods, tools and skills
I. TCP/IP
    1. The TCP/IP protocol suite
    2. Layer 3 concepts
    3. IP addressing and subnetting
    4. Layer 2, Media access control, 802.3, 802.2 concepts
    5. DNS, ARP, DHCP
    6. TCP/IP troubleshooting methods, tools, and skills
J. Routing Protocols
    1. Protocol configuration
    2. Distance-vector, Link-state, interior and exterior routing protocols
    3. RIP and RIPng
    4. OSPF and EIGRP
    5. Routing troubleshooting methods, tools, and skills
K. LAN Network System Troubleshooting
    1. Troubleshooting methodologies
    2. Troubleshooting tools
    3. Troubleshooting techniques
    4. Critical thinking in problem definition, evaluation, and resolution
    5. Organized approach to troubleshooting

VI. METHODS OF INSTRUCTION:
A. **Lecture** -
B. **Lab** -
C. **Discussion** -
D. **Demonstration** -

VII. TYPICAL ASSIGNMENTS:
A. Reading:
    1. Read on-line curriculum chapter 4. Discuss OSI Layer 2 communications
    2. Access and read the RFC for ARP online at www.iana.org
B. Lab Assignment:
    1. Demonstrate the use of ping and traceroute.
    2. Configure a workstation to access the gateway router

VIII. EVALUATION:
A. **Methods**

    1. Quizzes
    2. Other:
        a. Individual demonstrations
        b. Hands-on lab assignments for each module
        c. Written final
        d. Hands-on final

B. **Frequency**

    1. Weekly module quizzes
    2. Written final
    3. Hands-on final
    4. Weekly lab assignments

IX. TYPICAL TEXTS:
1. Wendell Odom, Sean Wilkins *Cisco CCENT ICND1 100-101 Official Cert Guide*., Cisco Press, 2013.
2. Cisco Networking Academy on-line curriculum.
3. ACM.org student membership

X. OTHER MATERIALS REQUIRED OF STUDENTS:
A. Association of Computing Machinery ACM.org student membership