

## FLORIDA STATE COLLEGE AT JACKSONVILLE

## COLLEGE CREDIT COURSE OUTLINE

COURSE NUMBER: CGS 1071

COURSE TITLE: Network Technician Foundations

PREREQUISITE(S): CGS 1060 or CGS 1100

COREQUISITE(S): CGS 1824

CREDIT HOURS: 3

CONTACT HOURS/WEEK: 4

CONTACT HOUR BREAKDOWN:

    Lecture/Discussion: 3

    Laboratory: 1

    Other \_\_\_\_\_:

FACULTY WORKLOAD POINTS: 3.7

STANDARDIZED CLASS SIZE  
ALLOCATION: 24

## CATALOG COURSE DESCRIPTION:

This course teaches the foundational skills required of students majoring in Networking Services Technology. Skills learned may include number system conversion, using the command line, Internet research and support skills, referencing documentation, interpreting charts and diagrams, problem determination and solution testing, navigating and maintaining directory trees, walking through batch files and scripts, evaluating specification requirements, and determining values for address ranges/offsets, variables, headers, fields, and registers. Students taking this course should also register for CGS 1824 at the same time.

SUGGESTED TEXT(S): To be custom compiled from various sources.

IMPLEMENTATION DATE: Fall Term, 2003 (20041)

REVIEW OR MODIFICATION DATE:

COURSE TOPICS	CONTACT HOURS <u>PER TOPIC</u>
I. Technician Skills Overview	4
II. Binary/Octal/Decimal/Hexadecimal Number Systems	4
III. Determining Values from Registers, Headers, Variables, etc.	4
IV. Determining Address Ranges and Offsets	4
V. Interpreting Visual Diagrams and Charts	4
VI. Navigating and Maintaining Directory Trees	4
VII. Using the Command Line	4
VIII. Referencing System Documentation	4
IX. Walking through Batch Files and Scripts	4
X. Evaluating Specification Requirements	4
XI. Internet Research	4
XII. Product Evaluation and Comparison	4
XIII. Problem Determination and Solution Testing	4
XIV. Downloading and Applying Fixes and Upgrades	4
XV. Current Topics	4

PROGRAM TITLE: Networking Services Technology  
 COURSE TITLE: Network Technician Foundations  
 CIP NUMBER: 1507.030401(AS)/0507.030401(AAS)

LIST PERFORMANCE STANDARD ADDRESSED:

NUMBER(S): TITLES(S):

01.0 DEMONSTRATE UNDERSTANDING OF NETWORKED ENVIRONMENTS -- The student will be able to:

- 01.01 Explain the use of binary numbers to represent instructions and data.
- 01.02 Describe the hardware implications of the use of binary representation of instructions and data.
- 01.03 Convert numbers among decimal, binary, and hexadecimal representation.
- 01.04 Perform binary arithmetic.
- 01.05 Identify various coding schemes (ASCII, etc.).
- 01.06 Discuss various data types (signed and unsigned integers, floating point, etc).
- 01.07 Identify several advantages and disadvantages of networked and non-networked environments.
- 01.08 Describe current network environments, such as peer-to-peer and client/server.
- 01.09 Identify and discuss issues (such as security, privacy, redundancy, etc.) related to networked environments.
- 01.10 Identify and discuss issues related to naming conventions for user-ids, email, passwords, and network devices.
- 01.11 List and define layers in the OSI and TCP/IP network protocol models.
- 01.12 Identify and describe current relevant IEEE network standards.
- 01.13 Illustrate typical network topologies.
- 01.14 Identify advantages and disadvantages of each topology.
- 01.15 Describe the major functions of LAN hardware protocols such as ethernet, token ring, FDDI, and arcnet.
- 01.16 Describe LAN software protocols such as IPX/SPX, TCP/IP, and NetBEUI.
- 01.17 Discuss the nature of IP addresses and MAC addresses, and mapping between protocol addressing schemes.
- 01.18 Identify major emerging technologies (such as ATM, VPN, and voice over IP).
- 01.19 Identify and discuss technical issues related to emerging technologies (such as security, bandwidth capability, and gigabit transmission rates).
- 01.20 Discuss the design and function of a storage-area network (SAN).
- 01.21 Design a LAN, including the specification of architecture, hardware, software, etc.
- 01.22 Identify the advantages of VLANs.
- 01.23 Characterize a VLAN implementation.
- 01.24 Describe the function of a spanning tree algorithm.
- 01.25 Identify a proper network design with a spanning tree component.
- 01.26 Use Effectively two different and current network modeling tools.
- 01.27 Produce effective documentation.

02.0 DEMONSTRATE UNDERSTANDING OF DATA COMMUNICATIONS -- The student will be able to:

- 02.01 Differentiate between telecommunications and data communications.

## LIST PERFORMANCE STANDARD ADDRESSED: (CONTINUED)

NUMBER(S):            TITLES(S):

- 02.02 Describe the main functions of each relevant current standard setting organization (IEEE, TIA, etc.).
- 02.03 Compare and contrast digital communications lines and cable characteristics (e.g. ISDN, DSL, T-1 and T-3).
- 02.04 Describe ATM technology; discuss the functions and applications of this technology.
- 02.05 Describe the functioning of modems, their features and operating characteristics.
- 02.06 Define the features of an ASCII terminal.
- 02.07 Describe the function of a UART.
- 02.08 Discuss signal representation and modulation.
- 02.09 Describe current data code systems used in data communication.
- 02.10 Compare and contrast synchronous and asynchronous serial transmission.
- 02.11 Compare and contrast major data communications media in terms of data flow, data codes, and transmission codes.
- 02.12 Define common error detection and correction mechanisms.
- 02.13 Identify LAN access control methods (CSMA/CD, token passing, etc.).
- 02.14 Compare and contrast the major features of the LAN access methods.
- 02.15 Describe asynchronous protocols.
- 02.16 Describe synchronous serial link protocols.
- 02.17 Identify and describe file transfer protocols and methodologies.
- 02.18 Describe data compression methodologies used for file transfer.
- 02.19 Identify evolving issues, such as gigabit transmission requirements, voice over IP, and wireless technologies.

07.0 PERFORM INTERNETWORKING ACTIVITIES -- The student will be able to:

- 07.01 Describe WAN topologies and MAN topologies.
- 07.02 Differentiate between WAN topologies and LAN topologies.
- 07.03 Compare and contrast routing protocols (e.g., RIP, OSPF).
- 07.04 Describe the general routing problem and common solutions (including routing verses bridging).
- 07.05 Identify and describe WAN protocols.
- 07.06 Explain how the first three layers of the OSI model relate to routing and switching.
- 07.07 Describe various routing protocols such as RIP, OSPF.
- 07.08 Differentiate among routing, switching and bridging.
- 07.09 Install routers to simulate a WAN/LAN network.
- 07.10 Explain each step necessary for connecting a network to the Internet.
- 07.11 Explain the differences between connecting to the Internet via a dial-up connection vs. a dedicated connection.
- 07.12 Identify two major network issues associated with each of Internet, intranet, and extranet.
- 07.13 Implement LAN/WAN connections, including virtual private networks (VPN), permanent virtual circuits (PVC), frame relay, tunneling, remote and mobile user access, etc.
- 07.14 Define the basic software components of a WAN.
- 07.15 Configure routers to simulate a WAN/LAN network.
- 07.16 Explain the function and purpose of firewalls and firebreaks and their purpose.
- 07.17 Configure access lists to limit traffic and enhance security.
- 07.18 Explain three major security concerns relating to data communications.

## LIST PERFORMANCE STANDARD ADDRESSED: (CONTINUED)

NUMBER(S):            TITLES(S):

09.0 PERFORM TROUBLESHOOTING AND MAINTENANCE ACTIVITIES -- The student will be able to:

- 09.01 Describe the use and features of diagnostic test equipment.\*
- 09.02 Describe effective troubleshooting strategies and techniques to resolve basic hardware, software, and network problems.\*
- 09.03 Recognize and resolve basic hardware and software configuration problems.
- 09.04 Eliminate the obvious using techniques such as substitution.
- 09.05 Trace for connectivity issues through each system component.
- 09.06 Identify resources for troubleshooting including online documentation.
- 09.07 Follow standard operating procedures for troubleshooting hardware and software.
- 09.08 Implement restoration of critical resources.
- 09.09 Determine when to escalate issues based on predefined guidelines.
- 09.10 Document problems and solutions for future reference.
- 09.11 Assemble reference manual including frequently asked questions.
- 09.12 Define windows of opportunity for maintenance tasks.
- 09.13 Determine type of maintenance programs needed to ensure maximum system performance.
- 09.14 Determine service intervals and publish maintenance schedule.
- 09.15 Document maintenance performed.
- 09.16 Establish a plan of obsolescence.

10.0 PERFORM DOCUMENTATION AND TECHNICAL REFERENCE ACTIVITIES -- The student will be able to:

- 10.01 Describe appropriate documentation procedures and practices.
- 10.02 Effectively use locally maintained systems, software, and network documentation.
- 10.03 Produce and maintain system documentation, such as inventory, costs, installed software, and procedures.
- 10.04 Maintain network documentation, including server and workstation hardware and software specifications.
- 10.05 Document the router configuration.
- 10.06 Effectively use several standard visual modeling tools.
- 10.07 Maintain visual network documentation, such as cabling diagrams.
- 10.08 Describe effective strategies for online research.
- 10.09 Locate technical information online.
- 10.10 Evaluate information located through online research.
- 10.11 Correctly cite Internet-based resources.

12.0 DEMONSTRATE PROFESSIONAL DEVELOPMENT SKILLS -- The student will be able to:

- 12.01 Attending classes, seminars, and workshops.
- 12.02 Reviewing literature and reading current literature.
- 12.03 Evaluating skills and taking necessary steps to upgrade.