

**RENTON SCHOOL DISTRICT #403**

**CAREER AND LIFE SKILLS EDUCATION**

**NETWORKING TECHNOLOGY 1 – 4**

**CURRICULUM GUIDE**

Adopted by the Board of Directors: June 9, 1999

If you have special needs which require this document to be provided in an alternative format, please contact the school principal (or program director) or Kay Hermann, ADA/509 Compliance Coordinator, 425-204-2421, 300 S.W. 7<sup>th</sup> St., Renton, WA 98055-2307.

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## **ACKNOWLEDGEMENTS**

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## **A PHILOSOPHY OF EDUCATION FOR THE RENTON PUBLIC SCHOOLS**

A basic function and duty of a free society is the education of its children, youth and adults.

It is the responsibility of the schools to provide each student with the opportunities necessary to develop the scholarship, skills and attitudes which will enable the student to achieve mental, physical, emotional and social maturity.

Further, each student should, as a result of the school experience, be able to make decisions and to accept responsibility for those decisions.

POLICY: 6001

ADOPTED: February 3, 1977

Renton School District No. 403

Renton, Washington

Renton School District #403 recognizes the need for every graduate to have acquired job entry skills or at least to possess a level of knowledge and skills permitting continued training after high school.

**RENTON SCHOOL DISTRICT NO. 403**  
**GENERAL INSTRUCTIONAL GOALS**  
**Policy 6010**

The Renton School District fosters an educational process which helps all students achieve at their highest potential.

The Renton School District:

**LEARNING**

- Offers a curriculum which prepares our students for the future.
- Emphasizes that diversity contributes positively to the individual and to the community.
- Provides learning experiences matched to the needs, interests, and abilities of our diverse student population.
- Extends learning opportunities beyond the school.

**INSTRUCTION**

- Offers a variety of high quality instructional resources and services to students, staff, and community.
- Supports multiple instructional strategies.
- Provides resources and opportunities for continuing professional development of our staff.
- Conducts ongoing evaluations of our instructional programs.
- Maintains safe and inviting facilities that are conducive to learning.

**COMMUNITY**

- Creates partnerships which involve students, parents, staff and other community members and organizations.
- Promotes effective communication.
- Values and encourages development of a spirit of community service.
- Respects the rights and responsibilities of all.

As a result of the educational process in Renton, students will understand and apply:

Language skills including reading, writing and communication, with opportunities to learn world languages.

Mathematics skills including concepts, procedures, problem solving, reasoning, and mathematical language.

Science Skills including concepts, principles, and the scientific process.

Social studies skills, concepts, and processes - emphasizing history, geography, economics, international perspectives, multiculturalism, and participatory democracy.

Arts and humanities skills, concepts, and processes to create, perform, and solve problems and respond effectively.

Health and physical education skills, concepts, and processes to promote lifelong physical, mental and social well being.

In order to strengthen the above curricular areas, Renton students will understand and apply:

Thinking skills including the ability to - gather and analyze information, think logically, critically and creatively, integrate experience and knowledge in making reasoned judgments, and solve problems.

Career and life skills necessary for successful and responsible participation in family, work and community.

Technological skills to support learning, problem solving, and communication.

Skills necessary to be a lifelong learner and a contributor to the general welfare and the quality of life for all.

**EVALUATION:** The Renton School District regularly reviews, evaluates and modifies these General Instructional Goals to meet the changing needs of students, staff and community.

## RENTON SCHOOL DISTRICT #403

### CAREER AND LIFE SKILLS EDUCATION GOALS

#### **GOAL 1: PROVIDE HIGH QUALITY VOCATIONAL-TECHNICAL EDUCATION PROGRAMS AND SERVICE**

##### **Objectives:**

- A. Assure that students completing Vocational-Technical Education programs have technical and behavioral competencies and basic skills sufficient to succeed in the workplace or higher education.
- B. Establish course and/or program transferability and articulation processes among K-12, community and technical colleges, private schools, colleges and universities, industry, apprentice-related training, and military training.
- C. Establish and regularly review standards for all Vocational-Technical Education programs.
- D. Evaluate Vocational-Technical programs based on standards, objectives, placements, job performance, costs, and community/industry acceptance.
- E. Utilize global, national, state, regional, and local data and advisory committee recommendations to identify appropriate curriculum and course offerings, program standards which meet the need of families, communities, business and industry.
- F. Provide facilities, equipment and instructional programs which meet the needs of a changing workplace.
- G. Revise or discontinue these programs that no longer meet the needs of students, business, labor, industry, and/or the community.
- H. Provide qualified instructors and administrators for Vocational-Technical Education based on relevant certification standards.
- I.** Develop and utilize competency-based curricula for Vocational-Technical Education programs.

**GOAL 2: CONTRIBUTE TO THE ECONOMIC DEVELOPMENT OF THE STATE**

**Objectives:**

- A. Facilitate cooperation between public and private sector entities.
- B. Establish new Vocational-Technical programs based on existing and projected employment needs/demands and entrepreneurial opportunities.
- C. Work cooperatively with the public and private sectors, economic development organizations, labor, and educational institutions to provide creative, targeted programs that meet the needs of youth in economically depressed areas.
- D. Provide family life education programs which serve to strengthen families and contribute to the effectiveness of workers in managing their consumer and family roles and in their careers.
- E. Strengthen management skills for those seeking employment in worker owned and managed businesses.
- F. Create a stronger working partnership with Team Washington and other economic agencies and the associate development organizations.

**GOAL 3: ASSURE ALL INDIVIDUALS EQUAL ACCESS TO VOCATIONAL-TECHNICAL EDUCATION PROGRAMS, SERVICES, AND ACTIVITIES**

**Objectives:**

- A. Provide Vocational-Technical programs, services, and activities that are free from racial, socio-economic, age, ethnic or sex bias, discrimination or stereotyping.
- B. Provide access to barrier-free Vocational-Technical Education programs.
- C. Actively recruit under-represented groups to all aspects of Vocational-Technical Education.
- D. Provide supportive services which promote entrance and success in Vocational-Technical programs.

**GOAL 4: PROVIDE/UTILIZE AN INTEGRATED STATE PLANNING PROCESS**

**Objectives:**

- A. Involve business, industry, agriculture, labor and other governmental and educational agencies in the planning processes at the state and local levels to ensure that establishment of delivery objectives and budget priorities.
- B. Identify instructional area/programs based on demand, placements, training needs, program costs, and follow-up.
- C. Utilize local, regional, state, national and global employment data, trends and advisory committees/organizations in identifying program offerings.

**GOAL 5: PROVIDE AND MARKET VOCATIONAL-TECHNICAL EDUCATION**

**Objectives:**

- A. Increase public awareness, understanding, and acceptance of Vocational-Technical Education.
- B. Actively involve students, parents, community leaders, legislators, labor representatives, business organizations, industry, representatives, and other decision-makers from state and local arenas in Vocational-Technical Education program events and issues.

**GOAL 6: PROVIDE INDIVIDUALS WITH CAREER DEVELOPMENT PROGRAMS AND EXPERIENCES**

**Objectives:**

- A. Provide career orientation, exploration, occupational information, self-appraisal, and educational planning.
- B. Provide instruction in job search, job retention and job change skills and further education pursuits.
- C. Assure that Vocational-Technical Education programs encompass demands of today's workplace and include attitudinal, employability, leadership, basic interpersonal, and job specific skills.

**GOAL 7: ASSURE A QUALITY STAFF DEVELOPMENT PROGRAM**

**Objectives:**

- A. Provide appropriate channels for advisory committee recommendations in the program and policy-making process.
- B. Provide in-service training opportunities for local advisory committee members.
- C. Provide in-service training for administrators and Vocational-Technical instructors regarding the effective use of advisory committees.

## RENTON SCHOOL DISTRICT NO.403

### Renton, Washington

#### CAREER AND LIFE SKILLS EDUCATION

Renton School District #403 operates a comprehensive Career and Life Skills Education Program through its four comprehensive high schools and two alternative programs. The district also participates in two countywide Tech Prep consortia with local community and technical colleges. This partnership allows students to earn college credit while still enrolled in high school programs. Secondary and post-secondary curricula are coordinated and students master and achieve skills, concepts, and technical competencies in high school that articulate with college programs. Students earn credit towards high school graduation and college technical programs at their home high schools.

The focus has changed in recent years from an emphasis on only job preparation to one of career exploration and exposure. While skill development and employment readiness is still a primary goal, emphasis has been placed on career exploration, career pathway preparation, and post-secondary articulation.

The **Family and Consumer Science Education Program** is offered at Hazen, Lindbergh, Renton, and Black River High Schools. The program is comprised of the following: Careers in Education; Careers with Children; Children & Parenting; Design; Eating Well/Creative Foods; Exploring Early Childhood and Exploring Early Childhood/Work Experience; Family Health; Health Club; Independent Living; Personal Choices; Teen Parenting/GRADS; and American Sign Language. School district and community sites provide applied workbased learning opportunities for program students.

The **Business Education Program** is offered in the District's three comprehensive high schools and at the Sartori Learning Center. The program consists of technical business related classes sequentially arranged into a course of instruction leading to a Certificate of Proficiency or Mastery to facilitate job placement or post secondary articulation. These courses are as follows: Business Communications; Business Connections 1-2; Business Connections Work Experience 1-2; Business law; Business Management; Computer Applications; Electronic Math Applications; Information Processing; Machine Transcription; Principles of Business; Recordkeeping; Word Processing 1-2; and Advance Word Processing. The Business Connections Workbased Learning component provides actual related job experience through workstations in the community. Business programs are often arranged and blocked with language arts programs to support program integration and technology use in the writing process.

A comprehensive **Workbased Learning Program** is offered in all of the facilities in the Renton School District. This program couples on-the-job experience and related classroom training to prepare students for employment during and beyond high school. The **Marketing Education** and **Diversified Occupations Programs** provide students the opportunity to combine related classroom instruction and paid work experience to earn high school credit. These programs assist and support students as they make the transition from

school to work. **Volunteer experiences, Internships, Job Shadows, and Service Learning** are also strong components of this community based applied experiences.

The community also plays a vital role in other programs offered through the Renton School District. The **Health Careers/ Sciences Program** is reliant on clinical training stations and coordinated work experiences for students through local convalescent centers, nursing facilities, and community hospitals. This program is offered to all students in the Renton School District but operates only at Hazen High School.

**Technology Education Programs** are offered at all three comprehensive high school facilities, and the Sartori Education Center. These programs are often integrated with the Science and Math departments to support applied learning and the development of technical skills and competencies for all students. Courses in this department are: Automotive Service Technician 1-2; CAD & Computer Graphics 1-2; Computer Graphics and Communications Related Careers 1-2; Electronics and Related Careers 1-2; Engineering Drafting and Related 1-2; Fundamentals of Networking Technology 1-2; Light Duty Mechanics and related Careers 1-2; Materials Science and Technology 1-2; Metalworking, Construction, Maintenance and Related Careers 1-2; Power and Energy 1-2; Principles of Technology 1-2; Video Production 1-2; Woodworking, and Construction, Maintenance and Related Careers.

Integrated instruction has been the focus of the Career and Life Skills instructional team for the past several years and the results can be seen throughout the program in each of the secondary schools. Several programs have been launched and are operating very successfully in all of the secondary sites. While these programs qualify for vocational funding, the district has made the commitment to operate them in collaboratively with a related academic instructor. These **Applied Vocationally Approved Programs** are titled: Applied Communications; Applied Mathematics; Material Science Technology; and Principles of Technology.

Renton School District has made a commitment to provide vocational training and job preparation opportunities for Special Needs students in addition to mainstreaming them, when appropriate. In order to have enough students to allow several offerings, the district has entered into interdistrict cooperative agreements with surrounding districts to accept students on a space available basis. There are four such **special programs**: **Building Maintenance** operates at the Sartori Learning Center and the **Career Ladders/Community Classroom** is offered at Valley Medical Center. The **Horticulture/Landscape Design 1-2 Program** is operated at Black River High School and **Health Careers** section is located at Hazen High School.

The district is also a partner in the Vocational/Special Education consortium of King County School Districts. The primary purpose of this participation is to make Vocational-Technical Education more accessible to persons with disabilities, provide additional inservice opportunities to all instructors and support to vocational instructors as they provide applied learning opportunities to special needs students.

**RENTON SCHOOL DISTRICT NO. 403**  
**CAREER AND LIFE SKILLS EDUCATION**

**MISSION STATEMENT**

The mission of career and life skills education in the Renton School District #403 is to prepare all learners for successful roles in families, careers and communities.

**THREE BELIEFS**

**A. Beliefs about individual needs**

1. All learners have unique gifts and talents and can be successful.
2. All learners must develop self-esteem and personal confidence for productive roles in society.
3. All learners need to have and attain personal and career goals, arising from a lifespan approach to personal growth and career development.

**B. Beliefs about society's expectations**

1. All learners must be prepared to become ethical, responsible and contributing world citizens.
2. All learners must adapt to change and participate in lifelong learning.
3. All learners must prepare for family roles and to balance work and family responsibilities.
4. All learners must develop essential creative/critical thinking, problem solving and communication skills.
5. All learners must value and have an appreciation for diversity in their schools, communities and workplaces.
6. All learners must recognize the impact of productive work on our economy.

**C. Beliefs about systems that care for and support learners**

1. All learners must have equitable access to a quality education.
2. All learners deserve to participate in learning systems where programs are mutually reinforcing and interdependent and where learning is related to life applications.
3. All learners must discover that school is part of a broader set of community resources they must access for learning and for achieving success in life.
4. All school programs must be developed in cooperative with family, business, labor and community representatives.
5. All staff must be accountable to ensure that all learners have the opportunity to establish and reach their goals.

## **NETWORKING TECHNOLOGY 1-4**

### **History**

As a result of reviewing current and projected employment trends and new and emerging occupations, the Career and Life Skills staff initiated a student interest survey in 1996. An area of high student interest and potential employment growth was in the computer technology field.

The district formed an advisory committee made up of individuals from the perspective industry and made sure that both management and labor were represented. District personnel from the Network Services department were also included to ensure that a partnership was created that would benefit potential program students and staff throughout the RSD system.

This group developed a curriculum package and system that supported student learning and instructional technology district-wide. Training takes place in a fully equipped laboratory by certified instructors and they utilize the district as a whole to support student learning experiences.

The program was launched as a pilot in the fall of 1997 at the Sartori Education Center which remains a satellite for the district and serves students from all of the high schools throughout the district. The advisory committee is still active and plays a vital role in the operation of the program and the maintenance of the curriculum and processes.

## **NETWORKING TECHNOLOGY 1-4**

### **Overview**

The Networking Technology Program is a four-semester sequence of classes that is an interdisciplinary elective, which supports applied and theoretical learning and processes. The course supports the development of student skills, knowledge, and the attitudes necessary to be successful in the workplace of the 21<sup>st</sup> century. Students will study and apply technical skills in the computer field, related technologies and occupations.

Program emphasis and student learning focuses on IS (Information Services) management, network administration, application, design, and the development of basic technical skills and competencies. Students will be familiar with software design and development, hardware design and operation, trouble-shooting and service.

Students will also develop leadership and communication skills and abilities that will help them to make the transition to the ever-changing workforce. Self sufficiency, professional development, and “life-long” learning in technological areas will be emphasized. Upon completion of the program students may earn and hold Cisco System and Service certification, Microsoft Essential certification, and be eligible for advanced placement through articulated community and technical college programs.

## **NETWORKING TECHNOLOGY 1 - 4**

### **Program Goals**

Upon graduation from this two year program, students will have the necessary technical skills to take an entry level position in the computer field in either a network administration position, technician, administrator, management, or network design.

This is a multi-tiered program that, at the professional level, gives the student the skills necessary to take part in the IS management. This includes network/application design, train users and IS management functions (Strategic Planning) at the technical level. The student would be adept at software design and creation and hardware/software skills would be very high. Upon completion, students would not be ready for a management position, but rather a technical worker.

This program will provide information about:

Basics: software, hardware, management, design and evaluation

Projects/Real World: retail, manufacturing, Internet, general office, specialized office (some of these projects will be one time only, i.e., wire a new school; others like creating a web site will be repeatable).

## **NETWORKING TECHNOLOGY 1-4 Program Standards**

In order for the Renton Networking Technology Program to be more effective, teachers will:

Target Washington State and Renton School District Essential Academic Learning Requirements as the minimum expectations for all students.

- Emphasize the use of manipulatives at all levels as an effective instructional tool.
- Include a variety of problem solving activities throughout the instructional program.
- Encourage students to clearly and effectively communicate Networking and Related Computer Technology.
- Emphasize that students will assess their performance on Networking Technology and Related Computer skills based on pre-determined criteria.
- Utilize broad-based assessment tools to maintain records of students' progress in Networking Technology.

## **NETWORKING TECHNOLOGY 1 – 4**

### **Outcomes/Objectives**

1. Identify electrical safety and ESD issues
2. Identify the use of electrical measurement terms and tools
3. Identify, assemble and install the components of a PC
4. Access and program a computer BIOS
5. Troubleshoot and solve POST and BIOS level computer faults
6. Partition and format a hard drive
7. Create a bootable floppy disk and a bootable hard drive
8. Install a DOS operating system with peripheral component drivers (network card and/or CD)
9. Install an operating system from floppy disks, a CD or a network
10. Identify and resolve device conflicts (IRQ and I/O)
11. Configure memory and hard disk management to maximize performance
12. Install and make SCSI devices active
13. Use DOS-level commands to set up or troubleshoot a computer
14. Be able to write or edit CONFIG.SYS and AUTOEXEC.BAT files for DOS program compatibility
15. Access and use Windows 95 System tools to configure Windows 95
16. Access and modify WIN.INI, SYS.INI and Registry files to configure Windows 95
17. Explain print theory and operation in DOS and Windows 95
18. Install a local or network printer in Windows 95 and NT
19. Install and configure a modem and dial-up networking
20. Install and configure a network adapter in Windows 95 and NT
21. Install a video card and monitor with drivers in Windows 95 and NT
22. List the three major features of a computer network
23. List the three major network structures
24. List the advantages/disadvantages of each major network structure
25. Share a folder and/or printer in Windows 95 and Windows NT
26. List the three major network topologies and media used for each
27. List the maximum lengths and transmission speeds for thinnet, thicknet, fiber and UTP cable in Ethernet and Token Ring networks
28. Identify network cable media and end connectors by sight
29. Define EIA-TIA 568 standards for CAT 1 through CAT 5 cable
30. Create a CAT 5 UTP to a patch panel or wall jack using 568B
31. Terminate CAT 5 UTP to a patch panel or wall jack using 568B
32. Describe when fiber optic cable must be used due to distance or EMI
33. Explain the correct use of plenum-rated and non-plenum-rated cable
34. List the name and function of each layer in the 7-layer OSI model
35. List the three major physical-layer network protocols
36. Describe CSMA/CD, CSMA/CA and token passing
37. Describe the function of MAC and IP addresses
38. List four major ethernet network protocols or protocol suites
39. List whether the major ethernet protocols are routable or non-routable
40. Identify network address, host address and appropriate subnet mask for a give IP address

41. Define bit, byte, packet and frame as they relate to data transmission
42. Explain the importance of managing IPX frame types
43. List default IRQ values for COM1, COM2, LPT1, LPT2, and a NIC
44. Define and list the proper implementations of repeaters, hubs, bridges, routers, routers and gateways
45. Identify the key features of WAN technologies, including DUN, X25, Frame Relay, DSL, ISDN, ATM, FDDI and SONET
46. Describe and select appropriate uses for RAID 0, 1 and 5
47. Install NT server using NetBEUI, IPX/SPX, or TCP/IP
48. Given a scenario, propose and appropriate network design

## **NETWORKING TECHNOLOGY 1 & 2**

### **Scope and Sequence**

#### **Unit 1: Safety**

1. Identify the potential hazards and proper safety procedures relating to lasers and high-voltage equipment.
  - Lasers
  - High-voltage equipment
  - Power supply
  - CRT
2. Identify the purpose of various types of preventive maintenance products and procedures and when to use/perform them.
  - Liquid cleaning compounds
  - Types of materials to clean contacts and connections
  - Vacuuming out systems, power 1-4
3. Identify ESD (Electrostatic Discharge) precautions and procedures, including the use of ESD protection devices.
  - What ESD can do, how it may be apparent or hidden
  - Common ESD protection devices
  - Situations that could present a danger or hazard

#### **Unit 2: Integrated Academics**

1. Mathematical concepts in application of skills, techniques and operations
  - Scientific concepts in application of skills, techniques and operations
  - Communications concepts in application of skills
    - Binary numbering and math
    - Decision making techniques
2. Higher level thinking skills for problem-solving
3. Technical Writing
  - Basic technical writing skills
4. Technology fundamentals
  - History of the computer
  - OS
  - Vocabulary
5. What they do and how they differ from each other (Pros and Cons)
  - Mac
  - Multiple versions of Windows
  - DOS
  - Multiple versions of Unix
  - Applications
  - Vocabulary
  - Word Processing
  - Spreadsheet
  - Database
  - Graphics
  - Communications

- Hardware
  - Vocabulary
  - Architectures: What they are and how they differ and the different things that we do on them
    - PCR
    - MAC
    - Mini world
    - Main Frame World
- Flow chart of process
  - Hard drive
  - Ram
  - Keyboard
  - Mouse
  - Components
- Software Development
  - Vocabulary

**Unit 3: Identify basic terms, concepts, and functions of system modules, including how each module should work during normal operation.**

Examples of concepts and modules:

- System board
- Power supply
- Processor / CPU
- Memory
- Storage devices
- Monitor
- Modem
- Firmware
- Boot process
- BIOS
- CMOS
- Troubleshooting/isolation/problem determination procedures/repair
- Determine whether hardware or software problem.
- Gather information from user regarding:
  - Customer environment
  - Symptoms/error codes
  - Situation when the problem occurred

**Unit 4: Identify the most popular type of motherboards, their components, and their architecture (for example, bus structures and power supplies).**

Content may include the following:

- Types of motherboards:
  - AT (Full and Baby)
  - ATX
- Components:
  - Communication ports

- SIMM AND DIMM
- Processor sockets
- External cache memory (Level 2)
- Bus architectures
  - ISA
  - EISA
  - PCI
  - USB (Universal Serial Bus)
  - VESA local bus (VL-Bus)
- PC Card (PCMCIA)
- Basic compatibility guidelines

**Unit 5: Distinguish between the popular CPU chips in terms of their basic characteristics.**

1. Popular CPU chips
2. Characteristics:
  - Physical size
  - Voltage
  - Speeds
  - On board cache or not
  - Sockets
  - Number of pins

**Unit 6: Identify the purpose of CMOS (Complementary Metal-Oxide Semiconductor), what it contains, and how to change its basic parameters.**

- Printer parallel port (Uni/bi-directional, disable/enable, ECP, EPP)
- COM/serial port memory address, interrupt request, disable
- Floppy drive enable/disable drive or boot, speed, density
- Hard drive size and drive type
- Memory parity, non-parity
- Boot sequence
- Date/Time
- Passwords

**Unit 7: Identify and be able to install the categories of RAM (Random Access Memory) terminology, their locations, and physical characteristics.**

1. Terminology:
  - EDO RAM (Extended Data Output RAM)
  - DRAM (Dynamic Random Access Memory)
  - SRAM (Static RAM)
  - VRAM (Video RAM)
2. Locations and physical characteristics:
  - Memory bank
  - Memory chips (8-bit, 16-bit, and 32-bit)
  - SIMMS (Single In-line Memory Module)
  - DIMMS (Dual In-line Memory Module)

- Parity chips versus non-parity chips

**Unit 8: Identify and perform basic procedures for adding and removing field replaceable modules.**

Examples of modules:

- System board
- Storage device
- Power supply
- Processor /CPU
- Memory
- Input devices

**Unit 9: Identify available IRQs, DMAs, and I/O addresses and be able to perform procedures for configuring them for device installation.**

- Standard IRQ settings
- Modems
- Floppy drives
- Hard drives

**Unit 10: Identify common peripheral ports, associated cabling, and their connectors.**

- Cable types
- Cable orientation
- Serial versus parallel
- Pin connections

**Unit 11: Identify and perform proper procedures for installing and configuring IDE/EIDE devices.**

- Master/slave
- Devices per channel

**Unit 12: Identify proper procedures for installing and configuring peripheral devices.**

- Monitor/Video Card
- Modem
- Storage devices

**Unit 13: Identify and perform proper procedures for installing and configuring SCSI devices.**

- Address/Termination conflicts
- Cabling
- Types (example: regular, wide, ultra-wide)
- Internal versus external
- Switch and jumper settings

**Unit 14: Identify basic concepts of printer operations and printer components and common problems. Identify types of printer connections and configurations and be able to install them.**

- Parallel
- Serial
- Network
- Types of Printers
- Laser
- Inkjet
- Dot Matrix
- Paper feeder mechanisms

**Unit 15: Customer Service**

Understand and implement proper customer relations for service business.

Understand and implement proper service procedures for billing, work orders, ordering parts, building or repairing a customer computer..

Understand procedures for starting a business of their own.

Work with school district IMS personnel for experience for on on-the-job tech support

**Unit 16: Windows OS 95-98-NT-2000 or current version of OS workstations**

1. Planning
  - Plan Windows OS security
  - Plan Windows OS file systems
  - Plan Windows OS printers
  - Plan Windows OS components
2. Installation and Configuration
  - Install Windows OS on an Intel-based machine.
  - Install Windows OS for a multi-boot situation
  - Install Windows OS in a migration situation
  - Uninstall Windows OS
3. Networking
  - Install and configure the basic networking protocols and components
4. Local access
  - Implement security on a Windows OS
  - Troubleshoot the logon process
  - Demonstrate ability to lock and unlock workstation.
  - Demonstrate ability to properly shut down a workstation
  - Create and modify passwords
  - Create and modify program groups
5. User and account management
  - Understand and implement the policies available for Workstation
  - Create user and group accounts.
6. Disk Resource Management
  - Know and understand NTFS
  - Demonstrate ability to set permissions and how to audit files and directories

- Resolve permissions applied to files, directories and shared directories.
- Manage partitions
- 7. Printer management
  - Create and manage local printers
  - Optimize printer performance
- 8. Application support
  - Understand how applications run different priorities and how these priorities affect performance.
  - Support applications in any subsystems on the network
  - Understand compatibility issues across Windows NT platforms.
- 9. Performance tuning and optimization
  - Monitor performance of various functions by using Performance Monitor
  - Identify performance bottlenecks
  - Monitor and resolve application, memory and paging issues
  - Be able to use the Windows NT Diagnostic tools.

### **Unit 17: Network Orientation**

1. Introduction to Networking
  - Define networking
  - The concept of networking
  - Why networking
2. Major types of networking
3. Peer-to-Peer
  - Server based
  - Combination
4. Networking Design
  - Standard Topologies
  - Devices
5. Connecting Networking Components
  - The physical media
  - Signal transmission
  - Wireless communications
  - Mobile computing
  - Network Adapter Card
  - Configurations settings
  - NIC Compatibility
  - Network Performance
  - Special Network cards
6. How a Network functions
  - OSI model
  - 802 Project
  - Drivers
  - How networks send data
  - Protocols
7. Putting Data on the Cable
  - Network Architectures

- Ethernet
  - Token Ring
  - AppleTalk/ArcNet
8. Network Operations
    - Network operating system setup
    - Network services
    - Network Printing
    - Implementing Network Applications
    - Networks in Multivendor environments
    - Client Server Environment
  9. Network Administration and Support
    - Managing Network Accounts
    - Managing Network Performance
    - Enduring Network Data Security
    - Avoiding Data Loss
  10. Larger Networks
    - Modems in Network Communications
    - Creating Larger Networks
    - Wide Area Networking
    - Advanced Wide Area Technologies
  11. Solving Network Problems
    - Monitoring network Behavior
    - Network Troubleshooting
    - Internet Resources
  12. IP addressing
    - Addressing schemes
    - Binary addressing
    - InterNIC addressing classes
  13. ARP and RARP (Address Resolution Protocol and Reverse Address Resolution Protocol)
  14. Routing and Routing Protocols
    - RIP
    - IGRIP
    - Enhanced IGRP
    - OSPF
  15. Cabling and Cable mounting
    - Handling of cable
    - Installation of cable
    - Safety precautions
    - Patch panel installation
    - Testing cable
  16. Wiring Closets
    - Specifications
    - Location and number
  17. Electrical concepts and LANS
  18. Understanding connection between basic electrical concepts and LAN wiring

- Understand process of data transmission
19. Job Seeking Skills
    - Preparation for employment
    - Resume
  20. Leadership Development-
    - Computer Club- Skills USA Competition
  21. Human Relationships
  22. Citizenship Technology in the workplace
  23. Router Programming with various protocols (TCP/IP, RIP, EIGRP, OSPF, RIP2, etc.)

## **Networking Technology 3 & 4 Scope and Sequence**

### **Unit 1: Windows NT Server (4.0 and 2000) or current dominant OS**

- Planning
- Plan the disk drive configuration for various requirements.
  - Choose a protocol for various situations.
- Installation and Configuration
  - Install Windows NT Server on an intel-based machine.
  - Install Windows NT Server to perform various server roles.
  - Install Windows NT Server by using various methods.
  - Configure protocols and protocol bindings
  - Configure network adapters
  - Configure Windows NT Server core services
  - Configure peripherals and devices
  - Configure hard disks to meet various requirements
  - Configure printers
  - Configure a Windows NT Server computer for various types of client computers
- Managing Resources
  - Manage user and group accounts
  - Create and manage policies and profiles for various situations
  - Administer remote servers from various types of client computers
  - Manage disk resources
- Connectivity
  - Install and configure an intranet server
  - Install and configure Remote Access Service
  - Configure RAS clients
- Monitoring and Optimization
  - Monitor performance of various functions by using Performance Monitor
  - Identify performance bottlenecks
- Troubleshooting
  - Choose the appropriate course of action to take to resolve installation failures.
  - Choose the appropriate course of action to take to resolve boot failures
  - Choose the appropriate course of action to take to resolve configuration errors.
  - Choose the appropriate course of action to take to resolve printer problems
  - Choose the appropriate course of action to take to resolve RAS problems
  - Choose the appropriate course of action to take to resolve connectivity problems

- Choose the appropriate course of action to take to resolve resource access and permission problems.
- Choose the appropriate course of action to take to resolve fault-tolerance failures.

## **Unit 2: Router Programming**

- List the required IPX address and encapsulation type
- Configure IPX access lists and SAP filters to control basic Novell traffic
- Enable the Novel IPX protocol on the router
- Monitor Novell IPX operation on the router
- Describe the advantages of LAN segmentation
- Describe LAN segmentation using bridges.
- Describe LAN segmentation using routers.
- Describe LAN segmentation using switches.
- Name and describe two switching methods
- Describe full- and half-duplex Ethernet operation.
- Describe network congestion problem in Ethernet networks
- Describe the benefits of network segmentation with bridges.
- Describe the benefits of network segmentation with routers.
- Describe the benefits of network segmentation with switches.
- Describe the features and benefits of Fast Ethernet.
- Distinguish between cut-through and store-and-forward LAN switching
- Describe the operation of the Spanning Tree Protocol and its benefits.
- Describe the benefits of virtual LANs.
- Differentiate between the following WAN services: LAPB, Frame Relay, ISDN/LADP, HDCL, PPP, and DDR
- Recognize key Frame Relay terms and features.
- List commands to configure Frame Relay LMIs, maps, and sub-interfaces.
- List commands to monitor Frame Relay operation in the router.
- Identify PPP operations to encapsulate WAN data on Cisco routers
- State a relevant use and context for ISDN networking.
- Identify ISDN protocols, function groups, reference points, and channels.
- Describe Cisco's implementation of ISDN BRI

## **NETWORKING TECHNOLOGY 1-4 Instructional Materials**

Windows NT Technical Support, Microsoft Press, Academic Learning Series with Lab Manual, 1998

A Guide to Microsoft Windows 98, Michael Jang, Course Technology MCSE Networking with Transcender Test Prep Software, 1999.

Networking Essentials Second Edition with CD ROM, Microsoft Press, Academic Edition, 1998

A Guide to Microsoft Windows NT Server 4.0 with CD ROM, Michael Palmer, Course Technology, 1998

A Guide to Networking Essentials, with Transcender test CD ROM, Tittel-Johnson, Course Technology

Cisco Systems Networking Academy Curriculum, Cisco Systems Inc. Semester 1,2, 3 and 4, 2001.

Testout! A+ Hardware, OS Technologies, CCNA, CAN, MCSE, Net+, and Windows 2000 Curriculum, Testout Corporation, 2001

Discovering Computers 2001, Shelly Cashman Series, Course Technology, 2001

## **NETWORKING TECHNOLOGY 1 – 4**

### **Evaluation**

The following criteria are applicable in the total evaluation of student progress:

1. Student performance in the shop and laboratory.
2. Creative solutions to the assigned projects.
3. Project reporting techniques.
4. Class participation.
5. Performance in the project competitions.

**NETWORKING TECHNOLOGY 1-4**  
**Washington State Essential Academic Learning Requirements**

**Reading**

The student understands and uses different skills and strategies to read.  
The student understands the meaning of what is read.  
The student reads different materials for a variety of purposes.  
The student sets goals and evaluates progress to improve reading.

**Writing**

The student writes clearly and effectively.  
The student writes in a variety of forms for different audiences and purposes.  
The student understands and uses the steps of the writing process.  
The student analyzes and evaluates the effectiveness of written work.

**Communication**

The student uses listening and observation skills to gain understanding.  
The student communicates ideas clearly and effectively.  
The student uses communication strategies and skills to work effectively with others.  
The student analyzes and evaluates the effectiveness of formal and informal communication.

**Social Studies: History**

The student understands the origin and impact of ideas and technological developments on history and social change.