

Course Outline

Information and Communication Technologies

REVISED: July/2022

Job Title

Computer User Support Specialist

Career Pathway:

Information Support and Services

Industry Sector:

Information and Communication Technologies

O*NET-SOC CODE:

15-1232.00

CBEDS Title:

Computer Repair & Support

CBEDS No.:

4633

74-15-50

A+ Certification/1

Credits: 10

Hours: 130

Course Description:

This competency-based course is the first in a sequence of three designed for computer installation, preventive maintenance, networking, security, and troubleshooting. Instruction includes orientation and safety, hardware: motherboard, CPUs, add-on cards, storage devices, cable types, power supply, RAM, printers, peripheral and input devices, custom PC configuration, common operating systems, installation consideration and upgrade methods, Microsoft, MAC, LINUX features and command line tools, Microsoft Windows control panel utilities, mobile devices, hardware, components, and features, networking: Microsoft networking on a client/desktop, employability skills, and resume preparation. The competencies in this course are aligned with the California High School Academic Content Standards and the California Career Technical Education Model Curriculum Standards.

Prerequisites:

Enrollment requires a reading level of 6.0 as measured by the CASAS GOALS test. Recommend successful completion of one of the following courses: Computer Computer Ops./1: Foundations (75-35-80), Computer Ops./2: Applications (75-35-90), Computer Ops./3: Database Mgmt (75-45-50), Computer Ops./4: Presentations (75-45-60), or Computer Ops./5: IC3 Certification Preparation (75-45-70).

NOTE: For Perkins purposes this course has been designated as an **introductory** course.

Meets CompTIA A+ Essentials Certification requirements.

This course **cannot** be repeated once a student receives a Certificate of Completion.



COURSE OUTLINE COMPETENCY-BASED COMPONENTS

A course outline reflects the essential intent and content of the course described. Acceptable course outlines have six components. (Education Code Section 52506). Course outlines for all apportionment classes, including those in jails, state hospitals, and convalescent hospitals, contain the six required elements:

(EC 52504; 5CCR 10508 [b]; Adult Education Handbook for California [1977], Section 100)

COURSE OUTLINE COMPONENTS

LOCATION

GOALS AND PURPOSES

Cover

The educational goals or purposes of every course are clearly stated and the class periods are devoted to instruction. The course should be broad enough in scope and should have sufficient educational worth to justify the expenditure of public funds.

The goals and purpose of a course are stated in the COURSE DESCRIPTION. Course descriptions state the major emphasis and content of a course, and are written to be understandable by a prospective student.

PERFORMANCE OBJECTIVES OR COMPETENCIES

pp. 7-15

Objectives should be delineated and described in terms of measurable results for the student and include the possible ways in which the objectives contribute to the student's acquisition of skills and competencies.

Performance Objectives are sequentially listed in the COMPETENCY-BASED COMPONENTS section of the course outline. Competency Areas are units of instruction based on related competencies. Competency Statements are competency area goals that together define the framework and purpose of a course. Competencies fall on a continuum between goals and performance objectives and denote the outcome of instruction.

Competency-based instruction tells a student before instruction what skills or knowledge they will demonstrate after instruction. Competency-based education provides instruction which enables each student to attain individual goals as measured against pre-stated standards.

Competency-based instruction provides immediate and continual repetition. In competency-based education the curriculum, instruction, and assessment share common characteristics based on clearly stated competencies. Curriculum, instruction and assessment in competency-based education are: explicit, known, agreed upon, integrated, performance oriented, and adaptive.

COURSE OUTLINE COMPETENCY-BASED COMPONENTS
(continued)

COURSE OUTLINE COMPONENTS	LOCATION
<p>INSTRUCTIONAL STRATEGIES</p> <p>Instructional techniques or methods could include laboratory techniques, lecture method, small-group discussion, grouping plans, and other strategies used in the classroom.</p> <p>Instructional strategies for this course are listed in the TEACHING STRATEGIES AND EVALUATION section of the course outline. Instructional strategies and activities for a course should be selected so that the overall teaching approach takes into account the instructional standards of a particular program, i.e., English as a Second Language, Programs for Adults with Disabilities.</p>	p. 17
<p>UNITS OF STUDY, WITH APPROXIMATE HOURS ALLOTTED FOR EACH UNIT</p> <p>The approximate time devoted to each instructional unit within the course, as well as the total hours for the course, is indicated. The time in class is consistent with the needs of the student, and the length of the class should be that it ensures the student will learn at an optimum level.</p> <p>Units of study, with approximate hours allotted for each unit are listed in the COMPETENCY AREA STATEMENT(S) of the course outline. The total hours of the course, including work-based learning hours (community classroom and cooperative vocational education) is listed on the cover of every CBE course outline. Each Competency Area listed within a CBE outline is assigned hours of instruction per unit.</p>	Cover pp. 7-15
<p>EVALUATION PROCEDURES</p> <p>The evaluation describes measurable evaluation criteria clearly within the reach of the student. The evaluation indicates anticipated improvement in performances as well as anticipated skills and competencies to be achieved.</p> <p>Evaluation procedures are detailed in the TEACHING STRATEGIES AND EVALUATION section of the course outline. Instructors monitor students' progress on a continuing basis, assessing students on attainment of objectives identified in the course outline through a variety of formal and informal tests (applied performance procedures, observations, and simulations), paper and pencil exams, and standardized tests.</p>	pp. 17-18
<p>REPETITION POLICY THAT PREVENTS PERPETUATION OF STUDENT ENROLLMENT</p> <p>After a student has completed all the objectives of the course, he or she should not be allowed to reenroll in the course. There is, therefore, a need for a statement about the conditions for possible repetition of a course to prevent perpetuation of students in a particular program for an indefinite period of time.</p>	Cover

ACKNOWLEDGMENTS

Thanks to TRUNG LE, SYLVIA QUIJADA and AARON SAENZ for developing and editing this curriculum. Acknowledgment is also given to ERICA ROSARIO for designing the original artwork in the course cover designs.

ANA MARTINEZ
Specialist
Career Technical Education

MATTHEW OBERLANDER
Coordinator
Adult Education Instruction

ROSARIO GALVAN
Administrator
Division of Adult and Career Education

APPROVED:

JOE STARK
Executive Director
Division of Adult and Career Education

CALIFORNIA CAREER TECHNICAL EDUCATION MODEL CURRICULUM STANDARDS
Information and Communication Technologies Industry Sector
Knowledge and Performance Anchor Standards

1.0 Academics

Analyze and apply appropriate academic standards required for successful industry sector pathway completion leading to postsecondary education and employment. Refer to the Information and Communication Technologies academic alignment matrix for identification of standards.

2.0 Communications

Acquire and accurately use Information and Communication Technologies sector terminology and protocols at the career and college readiness level for communicating effectively in oral, written, and multimedia formats.

3.0 Career Planning and Management

Integrate multiple sources of career information from diverse formats to make informed career decisions, solve problems, and manage personal career plans.

4.0 Technology

Use existing and emerging technology, to investigate, research, and produce products and services, including new information, as required in the Information and Communication Technologies sector workplace environment.

5.0 Problem Solving and Critical Thinking

Conduct short, as well as more sustained, research to create alternative solutions to answer a question or solve a problem unique to the Information and Communication Technologies sector using critical and creative thinking, logical reasoning, analysis, inquiry, and problem-solving techniques.

6.0 Health and Safety

Demonstrate health and safety procedures, regulations, and personal health practices and determine the meaning of symbols, key terms, and domain-specific words and phrases as related to the Information and Communication Technologies sector workplace environment.

7.0 Responsibility and Flexibility

Initiate, and participate in, a range of collaborations demonstrating behaviors that reflect personal and professional responsibility, flexibility, and respect in the Information and Communication Technologies sector workplace environment and community settings.

8.0 Ethics and Legal Responsibilities

Practice professional, ethical, and legal behavior, responding thoughtfully to diverse perspectives and resolving contradictions when possible, consistent with applicable laws, regulations, and organizational norms.

9.0 Leadership and Teamwork

Work with peers to promote divergent and creative perspectives, effective leadership, group dynamics, team and individual decision making, benefits of workforce diversity, and conflict resolution such as those practiced in the Future Business Leaders of America and SkillsUSA career technical student organization.

10.0 Technical Knowledge and Skills

Apply essential technical knowledge and skills common to all pathways in the Information and Communication Technologies sector, following procedures when carrying out experiments or performing technical tasks.

11.0 Demonstration and Application

Demonstrate and apply the knowledge and skills contained in the Information and Communication Technologies anchor standards, pathway standards, and performance indicators in classroom, laboratory, and workplace settings, and through career technical student organizations such as Future Business Leaders of America and SkillsUSA.

Information and Communication Technologies Pathway Standards

A. Information Support and Services Pathway

Students in the Information Support and Services pathway prepare for careers that involve the implementation of computer services and software, support of multimedia products and services, provision of technical assistance, creation of technical documentation, and the administration and management of information and communication systems. Mastery of information and communication technologies is the foundation for all successful business organizations today. Persons with expertise in information and communication technologies support and services are in high demand for a variety of positions in business and industry.

Sample occupations associated with this pathway:

- ◆ Computer and Information System Manager
- ◆ Computer User Support Specialist
- ◆ Database Administrator
- ◆ Document Management Specialist
- ◆ Business Intelligence Analyst

A1.0 Describe the role of information and communication technologies in organizations.

A2.0 Acquire, install, and implement software and systems.

A3.0 Access and transmit information in a networked environment.

A4.0 Administer and maintain software and systems.

A5.0 Identify requirements for maintaining secure network systems.

A6.0 Diagnose and solve software, hardware, networking, and security problems.

A7.0 Support and train users on various software, hardware, and network systems.

A8.0 Manage and implement information, technology, and communication projects.

CBE
Competency-Based Education

COMPETENCY-BASED COMPONENTS
for the A+ Certification/1 Course

COMPETENCY AREAS AND STATEMENTS	MINIMAL COMPETENCIES	STANDARDS
<p>A. ORIENTATION AND SAFETY</p> <p>Understand, apply, and evaluate classroom and workplace policies and procedures used in accordance with federal, state, and local safety and environmental regulations.</p> <p>(2 hours)</p>	<ol style="list-style-type: none"> 1. Describe the scope and purpose of the course. 2. Describe the overall course content as a part of the linked Learning Initiative. 3. Describe classroom policies and procedures. 4. Describe the different occupations in the Information and Communication Technologies Industry Sector, which have an impact on the role of computer technicians. 5. Describe the opportunities available for promoting gender equity and the representation of non-traditional populations in computer technology. 6. Describe resource and time management and its importance to the successful operation of an organization. 7. Explain the impact of Environmental Protection Agency (EPA) legislation on Information and Communication Technologies Industry Sector practices in protecting and preserving the environment. 8. Describe and demonstrate the procedures for contacting proper authorities for the removal of hazardous materials based on the EPA standards. 9. Describe and demonstrate the use of the Safety Data Sheet (SDS) as it applies to the computer technology industry. 10. Describe the California Occupational Safety and Health Administration (Cal/OSHA) and its laws governing computer technicians. 11. Describe how each of the following insures a safe workplace: <ol style="list-style-type: none"> a. employees' rights as they apply to job safety b. employees' obligations as they apply to safety c. safety laws applying to electrical tools d. proper use of static straps and static mats 12. Pass the safety exam with 100% accuracy. 	<p>Career Ready Practice: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11</p> <p>CTE Anchor: Academics: 1.0 Communications: 2.3, 2.4, 2.5, 2.6 Career Planning and Management: 3.1, 3.4 Technology: 4.1, 4.3, 4.5 Problem Solving & Critical Thinking: 5.2, 5.4, 5.6 Health and Safety: 6.1, 6.2, 6.4, 6.5, 6.6, 6.7, 6.8 Responsibility and Flexibility: 7.2, 7.3, 7.4, Ethics and Legal Responsibilities: 8.2 Leadership and Teamwork: 9.5, 9.6 Technical Knowledge and Skills: 10.1, 10.2, Demonstration and Application: 11.1, 11.2</p> <p>CTE Pathway: A1.1, A1.2</p>

COMPETENCY AREAS AND STATEMENTS	MINIMAL COMPETENCIES	STANDARDS
<p>B. HARDWARE: MOTHERBOARD, CPUs, and ADD-ON CARDS</p> <p>Understand, install and configure motherboards, CPUs and add-on cards.</p> <p>(10 hours)</p>	<ol style="list-style-type: none"> 1. Understand and demonstrate the features and function of the following motherboard components: <ol style="list-style-type: none"> a. form factor b. connectors types c. BIOS/UEFI settings d. compatibility e. CMOS battery 2. Identify and describe the features and function of the following CPU features: <ol style="list-style-type: none"> a. multicore b. virtual technology c. hyperthreading d. speeds e. overclocking f. integrated GPU 3. Identify and demonstrate the features and function of the expansion cards: <ol style="list-style-type: none"> a. video b. sound c. network interface d. eSATA 4. Identify and demonstrate various cooling mechanisms: <ol style="list-style-type: none"> a. fans b. heat sink c. liquid d. thermal paste 5. Pass motherboard, CPUs, and add-on card competency exam. 	<p>Career Ready Practice: 1, 2, 5, 6, 10</p> <p>CTE Anchor: Academic: 1.0 Communications: 2.3, 2.7 Problem Solving & Critical Thinking: 5.2, 5.4 Health & Safety: 6.3, 6.4, 6.6, 6.8 Technical Knowledge & Skills: 10.1, 10.2, 10.3, 10.5, 10.7 Demonstration & Application: 11.1, 11.2</p> <p>CTE Pathway: A2.1, A2.3, A3.1, A8.3</p>
<p>C. HARDWARE: STORAGE DEVICES</p> <p>Select, install and configure storage devices.</p>	<ol style="list-style-type: none"> 1. Describe and demonstrate the installation, operation, and performance testing of storage devices: <ol style="list-style-type: none"> a. optical drives b. SSD (Solid-State drives) c. NVME (Nonvolatile Memory Express) d. EIDE (Enhance Integrated Drive Electronics) e. hybrid drives f. flash 2. Explain the difference between SATA and EIDE hard disk drives. 3. Configure and demonstrate RAID (Redundant Array of Independent Disks): <ol style="list-style-type: none"> a. Level 0 b. Level 1 c. Level 5 d. Level 10 4. Explain the advantages of hot swappable drives. 5. Pass storage devices competency exam. 	<p>Career Ready Practice: 1, 2, 5, 6, 10</p> <p>CTE Anchor: Academic: 1.0 Communications: 2.3, 2.7 Problem Solving & Critical Thinking: 5.2, 5.4 Health & Safety: 6.3, 6.4, 6.6, 6.8 Technical Knowledge & Skills: 10.1, 10.2, 10.3, 10.5, 10.7 Demonstration & Application: 11.1, 11.2</p>

COMPETENCY AREAS AND STATEMENTS	MINIMAL COMPETENCIES	STANDARDS
(10 hours)		CTE Pathway: A2.3, A8.3
<p>D. HARDWARE: CABLE TYPES</p> <p>Understand cable types, features and their purposes.</p> <p>(5 hours)</p>	<ol style="list-style-type: none"> 1. Identify and demonstrate the features and functions of network cables: <ol style="list-style-type: none"> a. ethernet b. fiber c. coaxial d. speed and transmission limitations 2. Demonstrate various video cables: <ol style="list-style-type: none"> a. VGA b. HDMI c. Mini-HDMI d. DisplayPort e. DVI f. DVI-D / DVI-I 3. Describe multipurpose and peripheral cables: <ol style="list-style-type: none"> a. lightning b. thunderbolt c. USB d. serial 4. Identify and demonstrate hard drive cables: <ol style="list-style-type: none"> a. SATA b. IDE c. SCSI 5. Pass cable types competency exam. 	<p>Career Ready Practice: 1, 2, 5, 6, 10</p> <p>CTE Anchor: Academic: 1.0 Communications: 2.3, 2.7 Problem Solving & Critical Thinking: 5.2, 5.4 Health & Safety: 6.3, 6.4, 6.6, 6.8 Technical Knowledge & Skills: 10.1, 10.2, 10.3, 10.5, 10.7 Demonstration & Application: 11.1, 11.2</p> <p>CTE Pathway: A2.3, A8.3</p>
<p>E. HARDWARE: POWER SUPPLY</p> <p>Understand power supply types and features and installation.</p>	<ol style="list-style-type: none"> 1. Identify and demonstrate the type and features of a computer power supply: <ol style="list-style-type: none"> a. input 115V vs. 220V b. output 5.5V vs. 12V c. 24-pin motherboard adapter d. wattage rating e. number of devices/types of devices to be powered 2. Pass a power supply competency exam. 	<p>Career Ready Practice: 1, 2, 5, 6, 10</p> <p>CTE Anchor: Academic: 1.0 Communications: 2.3, 2.7 Problem Solving & Critical Thinking: 5.2, 5.4 Health & Safety: 6.3, 6.4, 6.6, 6.8 Technical Knowledge & Skills: 10.1, 10.2, 10.3, 10.5, 10.7</p>

COMPETENCY AREAS AND STATEMENTS	MINIMAL COMPETENCIES	STANDARDS
(2 hours)		Demonstration & Application: 11.1, 11.2 CTE Pathway: A2.3, A8.3
F. HARDWARE: RANDOM ACCESS MEMORY (RAM) Understand, install and configure RAM.	<ol style="list-style-type: none"> 1. Explain the various RAM types: <ol style="list-style-type: none"> a. SODIMM b. DDR2 c. DDR3 d. DDR4 2. Identify and demonstrate the installation of RAM: <ol style="list-style-type: none"> a. single channel b. dual channel c. triple channel d. error correcting e. parity vs. non-parity 3. Pass a RAM Memory competency exam. 	Career Ready Practice: 1, 2, 5, 6, 10 CTE Anchor: Academics: 1.0 Communications: 2.3, 2.4, 2.5 Problem Solving & Critical Thinking: 5.1, 5.2, 5.4, 5.5, 5.6, 5.7 Health and Safety: 6.3, 6.4, 6.6, 6.8, 6.11 Technical Knowledge and Skills: 10.1, 10.2, 10.3, 10.5, 10.7 Demonstration and Application: 11.1, 11.2 CTE Pathway: A2.3, A6.1, A6.2, A6.3, A6.6, A8.3
G. HARDWARE: PRINTERS, PERIPHERAL AND INPUT DEVICES Explain print technologies and uses of various peripheral types.	<ol style="list-style-type: none"> 1. Describe and demonstrate various print technologies: <ol style="list-style-type: none"> a. laser b. inkjet c. thermal d. impact 2. Explain the purposes and uses of various peripheral types: <ol style="list-style-type: none"> a. ADF/flatbed scanner b. barcode scanner/QR scanner c. monitors d. VR headset e. signature pad f. game controllers g. camera/webcam 	Career Ready Practice: 1, 2, 5, 6, 10 CTE Anchor: Academic: 1.0 Communications: 2.3, 2.7 Problem Solving & Critical Thinking: 5.2, 5.4

COMPETENCY AREAS AND STATEMENTS	MINIMAL COMPETENCIES	STANDARDS
(8 hours)	<ul style="list-style-type: none"> h. microphone i. speakers j. headset k. external storage drives l. KVM m. magnetic reader/chip reader n. NFC/tap pay device o. smart card reader p. projector 3. Pass a printer and peripheral competency exam.	Health & Safety: 6.3, 6.4, 6.6, 6.8 Technical Knowledge & Skills: 10.1, 10.2, 10.3, 10.5, 10.7 Demonstration & Application: 11.1, 11.2 CTE Pathway: A2.3, A8.3
H. HARDWARE: CUSTOM PC CONFIGURATION Select and configure appropriate components for a custom PC configuration to meet customer specifications or needs.	<ul style="list-style-type: none"> 1. Demonstrate and configure a graphic/CAD/CAM design workstation: <ul style="list-style-type: none"> a. multicore processor b. high-end video c. maximum RAM 2. Demonstrate and configure an audio/video editing workstation: <ul style="list-style-type: none"> a. multicore processor b. high-end video c. maximum RAM d. specialized audio and video card e. large, fast hard drive f. dual monitors 3. Demonstrate and configure a virtualization workstation. 4. Describe standard thick client. 5. Explain the purpose of a thick client. 6. Explain the function of a network attached storage device. 7. Pass a custom PC configuration competency exam. 	Career Ready Practice: 1, 2, 5, 6, 10 CTE Anchor: Academic: 1.0 Communications: 2.4, 2.5 Problem Solving and Critical Thinking: 5.1, 5.2, 5.3, 5.4, 5.5, 5.6, 5.7 Health & Safety 6.6, 6.8 Technical Knowledge and Skills: 10.1, 10.2, 10.3, 10.5, 10.7, 10.11 Demonstration and Application: 11.1, 11.2 CTE Pathway: A2.1, A2.2, A2.3, A3.1, A3.3, A6.1, A6.2, A6.3, A6.6, A8.3
(10 hours)	<ul style="list-style-type: none"> 1. Describe and demonstrate the purpose of an operating system: <ul style="list-style-type: none"> a. Microsoft Windows b. Apple Macintosh OS c. Linux 2. Describe cell phone/tablet operating system: <ul style="list-style-type: none"> a. Android 	Career Ready Practice: 1, 2, 5, 6, 10

COMPETENCY AREAS AND STATEMENTS	MINIMAL COMPETENCIES	STANDARDS
<p>Compare and contrast common operating system types and their purposes.</p> <p>(10 hours)</p>	<ul style="list-style-type: none"> b. iOS c. Chrome OS <ol style="list-style-type: none"> 3. Compare and contrast features of Microsoft Windows versions. 4. Explain Corporate vs. personal needs. 5. Pass an operating system type exam. 	<p>CTE Anchor: Academic: 1.0 Communications: 2.3, 2.7 Problem Solving & Critical Thinking: 5.2, 5.4 Health & Safety: 6.3, 6.4, 6.6, 6.8 Technical Knowledge & Skills: 10.1, 10.2, 10.3, 10.5, 10.7 Demonstration & Application: 11.1, 11.2</p> <p>CTE Pathway: A2.1, A2.3, A8.3</p>
<p>J. OPERATING SYSTEM: INSTALLATION CONSIDERATION AND UPGRADE METHODS</p> <p>General OS installation considerations and upgrade methods.</p> <p>(15 hours)</p>	<ol style="list-style-type: none"> 1. Explain Operating System installation consideration and upgrade methods: <ul style="list-style-type: none"> a. boot methods b. system requirements c. security considerations 2. Demonstrate different types of installations: <ul style="list-style-type: none"> a. in-place upgrade b. clean install c. repair installation d. multiboot e. remote network installation 3. Describe various types of file system types and formatting. 4. Explain partitioning. 5. Describe methods of installation and deployment. 6. Pass an operating system installation competency exam. 	<p>Career Ready Practice: 1, 2, 5, 6, 10</p> <p>CTE Anchor: Academic: 1.0 Communications: 2.3, 2.7 Problem Solving & Critical Thinking: 5.2, 5.4 Health & Safety: 6.3, 6.4, 6.6, 6.8 Technical Knowledge & Skills: 10.1, 10.2, 10.3, 10.5, 10.7 Demonstration & Application: 11.1, 11.2</p> <p>CTE Pathway: A2.1, A2.3, A3.1, A5.1, A8.3</p>

COMPETENCY AREAS AND STATEMENTS	MINIMAL COMPETENCIES	STANDARDS
<p>K. OPERATING SYSTEM: MICROSOFT, MAC AND LINUX OPERATING SYSTEM FEATURES AND COMMAND LINE TOOLS</p> <p>Explain and demonstrate Microsoft, MAC, and Linux operating system features and command line tools.</p> <p>(10 hours)</p>	<ol style="list-style-type: none"> 1. Demonstrate common windows command line tools: <ol style="list-style-type: none"> a. ipconfig b. ping c. tracert d. netstat e. nslookup f. chkdsk g. sfc h. diskpart i. net use j. ssh 2. Identify and demonstrate Microsoft administrative tools: <ol style="list-style-type: none"> a. MSConfig b. ask Manager c. Disk Manager d. System Utilities e. Computer Management 3. Identify and demonstrate Mac OS tools: <ol style="list-style-type: none"> a. Backup/Time Machine b. Restore/Snapshot c. Image recovery d. Disk maintenance utilities 4. Identify basic Linux commands. 5. Pass various operating system features and tools competency exam. 	<p>Career Ready Practice: 1, 2, 6, 10</p> <p>CTE Anchor: Academics: 1.0 Communications: 2.4, 2.5 Health & Safety: 6.6, 6.8 Technical Knowledge & Skills: 10.1, 10.2, 10.3, 10.5, 10.6, 10.7 Demonstration & Application: 11.1</p> <p>CTE Pathway: A2.2, A2.1, A2.3, A4.1, A4.2</p>
<p>L. OPERATING SYSTEM: MICROSOFT WINDOWS CONTROL PANEL UTILITIES</p> <p>Understand Microsoft Windows Control Panel utilities.</p>	<ol style="list-style-type: none"> 1. Demonstrate MS Windows Control Panel utilities: <ol style="list-style-type: none"> a. internet options b. display settings c. user accounts d. folder options e. system f. Windows firewall g. power options h. devices and printers i. network and sharing center j. Device Manager k. Bitlocker l. program and features 2. Pass MS Windows Control Panel utilities competency exam. 	<p>Career Ready Practice: 1, 2, 5, 6, 10</p> <p>CTE Anchor: Academic: 1.0 Communications: 2.3, 2.7 Problem Solving & Critical Thinking: 5.2, 5.4 Health & Safety: 6.3, 6.4, 6.6, 6.8 Technical Knowledge & Skills: 10.1, 10.2, 10.3, 10.5, 10.7 Demonstration & Application: 11.1, 11.2</p>

COMPETENCY AREAS AND STATEMENTS	MINIMAL COMPETENCIES	STANDARDS
(10 hours)		CTE Pathway: A2.1, A2.2, A2.3
<p>M. MOBILE DEVICES: HARDWARE, COMPONENTS, AND FEATURES</p> <p>Identify the hardware, components, and features of mobile digital devices.</p>	<ol style="list-style-type: none"> 1. Demonstrate hardware/device replacement for a laptop. 2. Describe components within the display of a laptop. 3. Identify laptop features: <ol style="list-style-type: none"> a. special function keys b. docking station c. port replicator d. physical laptop lock and cable lock 4. Compare and contrast characteristics of various types of mobile devices: <ol style="list-style-type: none"> a. tablets b. smartphones c. wearable technology d. GPS 5. Pass mobile devices competency exam. 	<p>Career Ready Practice: 1, 2, 5, 6, 10</p> <p>CTE Anchor: Academics: 1.0 Communications: 2.3, 2.4, 2.5 Problem Solving & Critical Thinking: 5.2, 5.2, 5.3, 5.4, 5.5, 5.6 Health & Safety: 6.3, 6.4, 6.6, 6.8 Technical Knowledge & Skills: 10.1, 10.2, 10.3, 10.5, 10.6, 10.7 Demonstration & Application: 11.1, 11.2</p> <p>CTE Pathway: A2.2</p>
<p>N. NETWORKING: MICROSOFT NETWORKING ON A CLIENT/DESKTOP</p> <p>Configure Microsoft Windows networking on a client/desktop.</p>	<ol style="list-style-type: none"> 1. Configure Microsoft Windows networking on a client/desktop: <ol style="list-style-type: none"> a. homegroup vs. workgroup b. domain setup c. network shares/administrative d. shares/mapping drives e. printer sharing vs. network f. printer mapping 2. Demonstrate networking connections: <ol style="list-style-type: none"> a. VPN b. Dial-ups c. Wireless d. Wired e. WWAN (Cellular) 3. Demonstrate and configuring IP address in Windows. 4. Identify different remote connections: <ol style="list-style-type: none"> a. proxy settings b. remote desktop connection c. remote assistance 5. Describe Firewall settings. 	<p>Career Ready Practice: 1, 2, 5, 6, 10</p> <p>CTE Anchor: Academics: 1.0 Communications: 2.3, 2.4, 2.5 Problem Solving & Critical Thinking: 5.2, 5.2, 5.3, 5.4, 5.5, 5.6 Health & Safety: 6.3, 6.4, 6.6, 6.8 Technical Knowledge & Skills: 10.1, 10.2, 10.3, 10.5, 10.6, 10.7</p>

COMPETENCY AREAS AND STATEMENTS	MINIMAL COMPETENCIES	STANDARDS
(15 hours)	6. Pass Microsoft networking competency exam.	Demonstration & Application: 11.1, 11.2 CTE Pathway: A2.2, A3.3, A5.4
O. EMPLOYABILITY SKILLS & RESUME PREPARATION Understand, apply, and evaluate the employability skills/resume preparation required in the A+ Certification field.	<ol style="list-style-type: none"> 1. Understand employer requirements for soft skills such as: <ol style="list-style-type: none"> a. punctuality and attendance b. time management c. flexibility and adaptability d. interpersonal skills e. work ethic f. communication and collaboration g. teamwork h. critical thinking and problem solving i. leadership and responsibility j. ethical behavior k. cultural and diversity differences 2. Create/revise a resume, cover letter and/or portfolio. 3. Review the role of online job searching platforms and career websites. 4. Complete and/or review an on-line job application. 5. Discuss interview skills to get the job: <ol style="list-style-type: none"> a. do's and don'ts for job interviews b. how to dress for the job 6. Create sample follow-up letters. 7. Understand the importance of the continuous upgrading of job skills as it relates to: <ol style="list-style-type: none"> a. certification, licensure, and/or renewal b. professional organizations/events c. industry associations and/or organized labor 	Career Ready Practice: 1, 2, 3, 4, 5, 7, 8, 9 CTE Anchor: Academics: 1.0 Communications: 2.2, 2.3, 2.4, 2.5 Career Planning & Management: 3.2, 3.3, 3.4, 3.6, 3.8 Technology: 4.1, 4.3 Problem Solving & Critical Thinking: 5.1 Responsibility & Flexibility: 7.2, 7.3, 7.4, 7.7 Ethics & Responsibilities: 8.4 Leadership and Teamwork: 9.2, 9.3, 9.4, 9.6 Demonstration & Application: 11.5 CTE Pathway: A1.1, A3.5
(3 hours)		

SUGGESTED INSTRUCTIONAL MATERIALS and OTHER RESOURCES

TEXTBOOKS

Meyers, Michael. CompTIA A+ Guide to Managing and Troubleshooting PCs, Latest Edition (Exams 220-1001 & 220-1002) Latest Edition, 2019.

PC Pro TestOut - [testout.com](https://www.testout.com)

RESOURCES

Employer Advisory Board members

CTE Model Curriculum Standards

<https://www.cde.ca.gov/ci/ct/sf/documents/infocomtech.pdf>

[Computing Technology Industry Association \(CompTIA\)](https://www.comptia.org/), 1815 S. Meyers Rd., Suite 300, Oakbrook Terrace, IL 60181-5228. Phone: (630) 678-8300. Fax: (630) 268-1384

Meyers, Michael. CompTIA A+ Certification All-in-One Exam Guide, 10th Edition. Mc-Graw-Hill Companies, 2019.

<https://www.bls.gov/ooh/computer-and-information-technology/computer-support-specialists.htm>

GCFGlobal - [Applying for Jobs Tutorials](https://www.gcfglobal.com/)

COMPETENCY CHECKLIST

TEACHING STRATEGIES and EVALUATION

METHODS AND PROCEDURES

- A. Lecture and discussion
- B. Multimedia presentations
- C. Demonstrations and participations
- D. Individualized instruction
- E. Peer teaching
- F. Role-playing
- G. Guest speakers
- H. Field trips and field study experiences
- I. Projects

EVALUATION

SECTION A – Orientation and Safety – Pass the safety test with 100% accuracy.

SECTION B – Hardware: Motherboard, CPUs, and Add-on Cards – Pass all assignments and exams with a minimum score of 80% or higher.

SECTION C – Hardware: Storage Devices – Pass all assignments and exams with a minimum score of 80% or higher.

SECTION D – Hardware: Cable Types – Pass all assignments and exams with a minimum score of 80% or higher.

SECTION E – Hardware: Power Supply – Pass all assignments and exams with a minimum score of 80% or higher.

SECTION F – Hardware: Random Access Memory (RAM) – Pass all assignments and exams with a minimum score of 80% or higher.

SECTION H – Hardware: Custom PC Configuration – Pass all assignments and exams with a minimum score of 80% or higher.

SECTION I – Operating System: Common Operating Systems – Pass all assignments and exams with a minimum score of 80% or higher.

SECTION J – Operating System: Installation Consideration and Upgrade Methods – Pass all assignments and exams with a minimum score of 80% or higher.

SECTION K – Operating System: Microsoft, MAC and LINUX Operating System Features and Command line Tools – Pass all assignments and exams on with a minimum score of 80% or higher.

SECTION L – Operating System: Microsoft Windows Control Panel Utilities – Pass all assignments and exams with a minimum score of 80% or higher

SECTION M – Mobile Devices: Hardware, Components, and Features – Pass all assignments and exams with a minimum score of 80% or higher.

SECTION N – Networking: Microsoft Networking on a Client/Desktop – Pass all assignments and exams with a minimum score of 80% or higher.

SECTION O – Employability Skills & Resume Preparation – Pass all assignments and exams with a minimum score of 80% or higher.

Standards for Career Ready Practice

1. Apply appropriate technical skills and academic knowledge.

Career-ready individuals readily access and use the knowledge and skills acquired through experience and education. They make connections between abstract concepts with real-world applications and recognize the value of academic preparation for solving problems, communicating with others, calculating measures, and performing other work-related practices.

2. Communicate clearly, effectively, and with reason.

Career-ready individuals communicate thoughts, ideas, and action plans with clarity, using written, verbal, electronic, and/or visual methods. They are skilled at interacting with others: they are active listeners who speak clearly and with purpose, and they are comfortable with terminology that is common to workplace environments. Career-ready individuals consider the audience for their communication and prepare accordingly to ensure the desired outcome.

3. Develop an education and career plan aligned with personal goals.

Career-ready individuals take personal ownership of their educational and career goals and manage their individual plan to attain these goals. They recognize the value of each step in the educational and experiential process, and they understand that nearly all career paths require ongoing education and experience to adapt to practices, procedures, and expectations of an ever-changing work environment. They seek counselors, mentors, and other experts to assist in the planning and execution of education and career plans.

4. Apply technology to enhance productivity.

Career-ready individuals find and maximize the productive value of existing and new technology to accomplish workplace tasks and solve workplace problems. They are flexible and adaptive in acquiring and using new technology. They understand the inherent risks—personal and organizational—of technology applications, and they take actions to prevent or mitigate these risks.

5. Utilize critical thinking to make sense of problems and persevere in solving them

Career-ready individuals recognize problems in the workplace, understand the nature of the problems, and devise effective plans to solve the problems. They thoughtfully investigate the root cause of a problem prior to introducing solutions. They carefully consider options to solve a problem and, once agreed upon, follow through to ensure the problem is resolved.

6. Practice personal health and understand financial literacy.

Career-ready individuals understand the relationship between personal health and workplace performance. They contribute to their personal well-being through a healthy diet, regular exercise, and mental health activities. Career-ready individuals also understand that financial literacy leads to a secure future that enables career success.

7. Act as a responsible citizen in the workplace and the community.

Career-ready individuals understand the obligations and responsibilities of being a member of a community and demonstrate this understanding every day through their interactions with others. They are aware of the impacts of their decisions on others and the environment around them, and they think about the short-term and long-term consequences of their actions. They are reliable and consistent in going beyond minimum expectations and in participating in activities that serve the greater good.

8. Model integrity, ethical leadership, and effective management.

Career-ready individuals consistently act in ways that align with personal and community-held ideals and principles. They employ ethical behaviors and actions that positively influence others. They have a clear understanding of integrity and act on this understanding in every decision. They use a variety of means to positively impact the direction and actions of a team or organization, and they recognize the short-term and long-term effects that management's actions and attitudes can have on productivity, morale, and organizational culture.

9. Work productively in teams while integrating cultural and global competence.

Career-ready individuals contribute positively to every team, as both team leaders and team members. To avoid barriers to productive and positive interaction, they apply an awareness of cultural differences. They interact effectively and sensitively with all members of the team and find ways to increase the engagement and contribution of other members.

10. Demonstrate creativity and innovation.

Career-ready individuals recommend ideas that solve problems in new and different ways and contribute to the improvement of the organization. They consider unconventional ideas and suggestions by others as solutions to issues, tasks, or problems. They discern which ideas and suggestions may have the greatest value. They seek new methods, practices, and ideas from a variety of sources and apply those ideas to their own workplace practices.

11. Employ valid and reliable research strategies.

Career-ready individuals employ research practices to plan and carry out investigations, create solutions, and keep abreast of the most current findings related to workplace environments and practices. They use a reliable research process to search for new information and confirm the validity of sources when considering the use and adoption of external information or practices.

12. Understand the environmental, societal, and economic impacts of decisions.

Career-ready individuals understand the interrelated nature of their actions and regularly make decisions that positively impact other people, organizations, the workplace, and the environment. They are aware of and utilize new technologies, understandings, procedures, and materials and adhere to regulations affecting the nature of their work. They are cognizant of impacts on the social condition, environment, workplace, and profitability of the organization.

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