



A+ Certification

COURSE DESCRIPTION:

This competency-based course prepares students for entry-level positions common in the computer maintenance and repair field such as a computer support specialist and computer service technician. Classroom instruction and practical experience will include installation and configuration of various components, diagnostics, operating systems and software. Students achieving competency in this course will be prepared to take the A+ Certification exams in both hardware and operating systems.

COURSE INFORMATION:

Prerequisite: None
 Dress Requirement and Grooming: Industry standard
 Course Length: 180 hours
 Recommendation: Additional 180 hours CC
 Curriculum Outline Revision Date: 05/06

CAREER TECHNICAL EDUCATION INDUSTRY SECTOR:

- **Engineering & Design**

STATE AND FEDERAL DESIGNATIONS	
System	Designation
California Basic Educational Data System Code (CBEDS)	5558
California Department of Education (CDE) Industry Sector	E-5
US Department of Education (USDOE) Career Cluster	Information Technology
US Department of Labor Dictionary of Occupational Titles (DOT)	039.264-010 Computer Support Specialist 003.161-014 Computer Service Technician 828.261-026 Computer Repair Tech. Assistant 033.162-018 Computer Tech Support Specialist

INFORMATION ABOUT COMPETENCY-BASED COURSES

A **course description** states the scope and content of a course.

Competency is a skill attainment.

Competency is the minimum level of skill a student has to demonstrate to achieve success.

Competency-based instruction measures student success by demonstration of competency and program seat time.

Competency-based instruction targets academic and career technical education to better prepare the individual for transition to either employment and/or higher education.

CALIFORNIA CTE FOUNDATION STANDARDS

The Foundation Standards include general competencies that all students need to master to be successful in the workplace in addition to the competencies listed in the curriculum specific to the occupational area. The Foundation Standards are similar to the competencies identified in the U.S. Department of Labor, Secretary's Commission on Achieving Necessary Skills (SCANS) Report. Subcomponents (not listed here) provide further detail about each Foundation Standard. The complete document California Career Technical Education Model Curriculum Standards, Grades Seven Through Twelve, is available at www.cde.gov.

1.0 Academics

Students understand the academic content required for entry into postsecondary education and employment in the Engineering and Design sector.

2.0 Communications

Students understand the principles of effective oral, written, and multimedia communication in a variety of formats and contexts.

3.0 Career Planning and Management

Students understand how to make effective decisions, use career information, and manage personal career plans.

4.0 Technology

Students know how to use contemporary and emerging technological resources in diverse and changing personal, community, and workplace environments.

5.0 Problem Solving and Critical Thinking

Students understand how to create alternative solutions by using critical and creative thinking skills, such as logical reasoning, analytical thinking, and problem-solving techniques.

6.0 Health and Safety

Students understand health and safety policies, procedures, regulations, and practices, including the use of equipment and handling of hazardous materials.

7.0 Responsibility and Flexibility

Students know the behaviors associated with the demonstration of responsibility and flexibility in personal, workplace, and community settings.

8.0 Ethics and Legal Responsibilities

Students understand professional, ethical, and legal behavior consistent with applicable laws, regulations, and organizational norms.

9.0 Leadership and Teamwork

Students understand effective leadership styles, key concepts of group dynamics, team and individual decision-making, the benefits of workforce diversity, and conflict resolution.

10.0 Technical Knowledge and Skills

Students understand the essential knowledge and skills common to all pathways in the Engineering and Design sector.

11.0 Demonstration and Application

Students demonstrate and apply the concepts contained in the foundation and pathway standards.

STUDENT LEARNING GOALS

In order to function as productive, involved members of society, San Bernardino County ROP students will:

1. Demonstrate personal skills that promote success and growth in the workplace

- a. Know the policies, procedures, and regulations regarding health and safety
- b. Understand the importance of responsibility and accountability
- c. Understand the role of ethical behavior
- d. Understand how to work as a member of a team as well as independently

2. Demonstrate career planning that leads to postsecondary education and/or employment

- a. Know the specific requirements in a career pathway for postsecondary education, certification, and/or licensure
- b. Apply effective strategies for self-promotion in the hiring process

3. Demonstrate appropriate application of academic skills and concepts necessary for entry into postsecondary education and/or employment

- a. Apply the principles of effective oral, written, and multimedia communication in a variety of formats and contexts
- b. Perform mathematical computations required for industry-specific applications

4. Demonstrate problem solving and critical thinking skills

- a. Use critical thinking skills to make informed decisions and solve problems
- b. Apply appropriate problem solving strategies and critical thinking skills to work-related issues and tasks

5. Demonstrate the use of appropriate technology used in the 21st Century

- a. Identify, analyze and integrate past, present and future technological resources for application in personal, workplace and community environments
- b. Utilize technological skills to enhance personal and career development

MAJOR INSTRUCTIONAL UNITS	CL Hours	CC Hours	CA Academic Content Standards	HSEE	Activity/Assessment
<p>I. Introduction Unit Objective: Review the course description and objectives, the facilities and equipment, and the expectations of both the teacher and the students. Unit Competencies:</p> <ul style="list-style-type: none"> A. Discuss the course and its objectives B. Review the equipment and facilities C. Sign and observe acceptable on-line student behavior and policy D. Discuss teacher and student expectations E. Identify and discuss the SLGs 	10		LA: grades 9/10 Reading 2.6 Writing 1.0, 1.5 Listening/speaking 1.0	✓ ✓	Distribute a syllabus containing all of the needed information. Read and discuss with students./ Follow with a Q&A session to check for understanding. Students and parents will read, sign and return the following day.
<p>II. Installation and Configuration Unit Objective: Demonstrate competency installing and configuring assorted hardware within various systems. Unit Competencies:</p> <ul style="list-style-type: none"> A. Identify the names, purpose, and characteristics of system modules B. Recognize these modules by sight or definition C. Identify basic procedures for adding and removing field-replaceable modules for desktop and portable systems D. Given a replacement scenario, choose the appropriate sequences. E. Identify typical IRQs, DMAs, and I/O addresses and procedures for altering these settings when installing and configuring devices 	30	30	LA: grades 9/10 Reading 1.1,1.2, 2.0 Writing 1.1, 1.2, 1.3, 1.5, 1.6, 1.8, 2.1	✓ ✓	Listen to lecture and write notes. Class Discussions Research, write and discuss technical terms and vocabulary associated with this unit. Teacher Evaluation Research and write a one-page installation manual with step-by-step directions for installing and configuring an operating system. Manual sequences are performed and steps verified for accuracy and logic.

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F. Choose the appropriate installation or configuration steps in a given scenario G. Identify the names, purposes and performance characteristics of standardized/common peripheral ports and associated cabling H. Recognize ports, cabling and connectors, by sight I. Identify proper procedures for installing and configuring common IDE devices J. Choose the appropriate installation or configuration sequences in given scenarios and recognize the associated cables K. Identify proper procedures for installing and configuring common SCSI devices L. Choose the appropriate installation or configuration sequences in given scenarios; recognize the associated cables M. Identify proper procedures for installing and configuring common peripheral devices N. Choose the appropriate installation or configuration sequences in given scenarios. O. Identify procedures to optimize PC operations in specific situations P. Predict the effects of specific procedures under given scenarios Q. Determine the issues that must be considered when upgrading a PC R. In a given scenario, determine when and how to upgrade system components					

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<p>III. Diagnosing and Troubleshooting Unit Objective: Demonstrate competency in diagnosing and troubleshooting common computer problems. Unit Competencies:</p> <ul style="list-style-type: none"> A. Recognize common problems associated with each module and their symptoms B. Identify steps to isolate and troubleshoot the problems C. Given a problem situation, interpret the symptoms and infer the most likely cause D. Identify basic troubleshooting procedures and tools. Describe how to elicit problem symptoms from customers. Justify asking particular questions in a given scenario 	20	30	LA: grades 9/10 Reading 1.1,1.2, 2.0 Writing 1.1, 1.2, 1.3, 1.5, 1.6, 1.8, 2.1	✓ ✓	Listen to lecture and write notes. Research, write, and discuss technical terms and vocabulary associated with diagnosing and troubleshooting. <i>Class Discussions</i> Summarize an article about current diagnostic procedures. <i>Essay Rubric, Teacher Evaluation</i>
<p>IV. Safety and Preventive Maintenance Unit Objective: Describe and demonstrate proper preventive maintenance, environmental and safety procedures. Unit Competencies:</p> <ul style="list-style-type: none"> A. Identify the various types of preventive maintenance measures, products and procedures and when/how to use them B. Identify various safety measures and procedures and when/how to use them C. Identify environmental protection measures and procedures and when/how to use them 	5	5	LA: grades 9/10 Writing 1.0, 1.1, 1.2, 1.3, 1.5, 1.6,1,8, 2.1, 2.6 Reading 1.0, 1.1, 1.2 Listening/speaking 1.0	✓ ✓	Listen to safety lecture and write notes. <i>Class Discussions, Lecture Notes</i> Research terms and definitions about electricity, tools, test equipment and safety requirements. <i>Worksheets, Vocabulary Quiz</i> Write an essay explaining why safety is important in the workplace (classroom). <i>Safety Test</i> Make a personal-safety checklist poster that you will use when you are working in the classroom lab.

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					Present checklist poster to class. <i>Class Activity</i>
<p>V. Motherboards, Processors & Memory Systems Unit Objective: Identify, describe and troubleshoot motherboards, memory systems and processor functions. Unit Competencies:</p> <ul style="list-style-type: none"> A. Describe the difference in popular CPU chips by their basic characteristics B. Identify the types of RAM (Random Access Memory), form factors, and operational characteristics. Determine banking and speed requirements under given scenarios. C. Identify the most popular types of motherboards, their components and their architecture (bus structures) D. Identify the purpose of CMOS (Complementary Metal-Oxide Semiconductor) memory, what it contains, and how/when to change its parameters. Given a scenario involving CMOS, choose the appropriate course of action 	10	10	LA: grades 9/10 Reading 2.6, 3.2 Written/Oral 1.1, 1.2, 1.3 1.4 Listening/speaking 1.3	✓ ✓	Research technical terms and vocabulary associated with system boards. <i>Class Discussion</i> Read Motherboard manuals to identify motherboards correctly. <i>Class Discussions</i> <i>Peer Evaluations</i>
<p>VI. Printers Unit Objective: Demonstrate competency identifying, configuring and connecting assorted printers. Unit Competencies:</p> <ul style="list-style-type: none"> A. Identify printer technologies, interfaces and options/upgrades B. Recognize common printer problems and techniques used to resolve them 	5	5	LA: grades 9/10 Reading 1.1, 1.2, 2.0 Writing 1.0 Listening/speaking 1.0	✓ ✓	Listen to lecture and write notes. <i>Class Discussion</i> Research, write, and discuss technical terms and vocabulary associated with printing devices <i>Teacher Evaluations/Worksheets</i> Research and give a verbal presentation on printer operation.

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					<i>Research Notes. Instructor and peer evaluation of presentation.</i>
VII. Computer Networking Unit Objective: Identify, describe, troubleshoot and correct basic network errors. Unit Competencies: <ul style="list-style-type: none"> A. Identify the common types of network cables, their characteristics and connectors B. Identify and describe basic networking concepts including how a network operates C. Identify common technologies available for establishing Internet connectivity and their characteristics 	10	10	LA: grades 9/10 Reading 1.0, 1.1, 1.2 Writing 1.0, 1.5	✓ ✓ ✓	Listen to lecture and write notes. Research, write, and discuss technical terms and vocabulary associated with Local Area Networks (LANs) and the Internet. <i>Class Discussions, Teacher Evaluations</i> Create a table that lists the layer name, protocols, and data encapsulation for the layers of OSI model. <i>Research Notes, Teacher evaluation</i>
VIII. Operating System Fundamentals Unit Objective: Identify, describe and use components of an operating system. Unit Competencies: <ul style="list-style-type: none"> A. Identify the major desktop components, interfaces and their functions. Differentiate the characteristics of Windows 9x/Me, Windows NT 4.0 Workstation, Windows 2000 Professional and Windows XP B. Identify the names, locations, purposes and contents of major system files 	25	30	LA: grades 9/10 Writing 1.0, 1.1, 2.3, 2.4	✓	Listen to lecture and write notes. <i>Class Discussions</i> Research, write and discuss technical terms and vocabulary associated with this unit. <i>Teacher Evaluation/Worksheets</i>

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<p>C. Demonstrate the ability to use command-line functions and utilities to manage the operating system, including the proper syntax and switches</p> <p>D. Identify basic concepts and procedures for creating, viewing and managing disks, directories and files including procedures for changing file attributes and the ramifications of those changes (for example, security issues)</p> <p>E. Identify and describe the major operating system utilities, their purpose, location and available switches</p>					
<p>IX. Installation, Configuration and Upgrading Operating Systems Unit Objective: Demonstrate and identify the proper procedures for installing, configuring and upgrading operating systems. Unit Competencies:</p> <p>A. Identify the procedures for installing Windows 9x/Me, Windows NT 4.0 Workstation, Windows 2000 Professional, and Windows XP and bringing the operating system to a basic operational level</p> <p>B. Identify steps to perform an operating system upgrade from Windows 9.x/ME, Windows NT 4.0 Workstation, Windows 2000 Professional, and Windows XP. Given an upgrade scenario, choose the appropriate next steps</p>	25	30	<p>LA: grades 9/10 Reading 1.1,1.2, 2.0 Writing 1.1, 1.2, 1.3, 1.5, 1.6, 1.8, 2.1 Listening/speaking 1.0</p>	<p>✓ ✓</p>	<p>Research technical terms and vocabulary associated with system boards. <i>Class Discussion, Research Notes</i> Read manuals to configure and troubleshoot systems correctly. <i>Peer Evaluations</i></p>

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<p>C. Identify the basic system boot sequences and boot methods, including the steps to create an emergency boot disk with utilities installed for Windows 9x/Me, Windows NT 4.0 Workstation, Windows 2000 Professional, and Windows XP</p> <p>D. Identify procedures for installing/adding a device, including loading, adding, and configuring device drivers and required software</p> <p>E. Identify procedures necessary to optimize the operating system and major subsystems.</p>					
<p>X. Diagnosing and Troubleshooting Operating Systems Unit Objective: Demonstrate and describe the proper techniques for diagnosing and troubleshooting operating systems. Unit Competencies:</p> <p>A. Recognize and interpret the meaning of common error codes and startup messages from the boot sequence and identify steps to correct the problems</p> <p>B. Recognize when to use common diagnostic utilities and tools. Given a diagnostic scenario involving one of these utilities or tools, select the appropriate steps needed to resolve the problem</p> <p>C. Recognize and describe common operational and usability problems and determine how to resolve them</p>	20	20	<p>LA: grades 9/10 Reading 1.1,1.2, 2.0 Writing 1.1, 1.2, 1.3, 1.5, 1.6, 1.8, 2.1 Listening/speaking 1.0</p>	<p>✓ ✓</p>	<p>Research technical terms and vocabulary associated with system boards. <i>Class Discussion, Research Notes</i> Read manuals to configure and troubleshoot systems correctly. <i>Peer Evaluations</i></p>

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<p>XI. Windows Networking Unit Objective: Identify and configure the networking and internet capabilities of Windows. Unit Competencies:</p> <ul style="list-style-type: none"> A. Identify the networking capabilities of Windows B. Given configuration parameters, configure the operating system to connect to a network C. Identify the basic internet protocols and terminologies D. Identify procedures for establishing Internet connectivity E. In a given scenario, configure the operating system to connect to and use Internet resources 	10	10			<p>Listen to lecture and write notes. Research, write, and discuss technical terms and vocabulary associated with windows networking systems and the Internet. <i>Class Discussion</i> <i>Teacher Evaluations</i> Create a list of protocols, <i>Research Notes/Teacher Review</i></p>
<p>XII. Job Search Techniques Unit Objective: Demonstrate job search and retention techniques and identify career strategies to prepare for employment. Unit Competencies:</p> <ul style="list-style-type: none"> A. Discuss career paths and goal setting B. Complete a data sheet and career-interest testing C. Complete a job application D. Create an error-free résumé E. Create a portfolio F. Complete a mock interview 	10		<p>LA: grades 9/10 Writing 1.0, 1.1 LA grades 11/12 Writing 2.5</p>	<p>✓ ✓ ✓</p>	<p>Listen to lecture and write notes. <i>Work Portfolios</i> Research, write, and discuss career paths. <i>Goal Setting Sheet, Career Goal Statement.</i> Write résumés. Cover letters, and other employment/business letters. <i>Self Assessment Sheet, Employment Letters, Mock Interviews</i></p>

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