



**SANTA CLARA COUNTY OFFICE OF EDUCATION  
SANTA CLARA COUNTY REGIONAL OCCUPATIONAL PROGRAM  
Serving Santa Clara and San Benito Counties**



**1. COURSE TITLE – CAREER TECHNICAL EDUCATION PATHWAY/SECTOR**

Computer Hardware Repair – Computer Hardware, Electrical, and Networking  
Engineering/ Engineering & Design

**2. CBEDS TITLE**

Computer Service Technology

**3. CBEDS NUMBER**

5558

**4. JOB TITLES**

O*NET	TITLE
85705	Data Processing Equipment Repairer
85717A	Electronics Mechanic and Technician
17-3023.01/ 11-2022.00/	Electronic Sale and Service Technician
93905B	Electronic Components Assembler

**5. COURSE DESCRIPTION**

Students will be prepared to install operating system programs, operate, maintain, and service computers and diagnose operational problems with computer hardware. Students will develop professional attitudes and abilities through group interaction while completing assignments and projects. Students will utilize lab training to identify components, determine possible remedies and accurately replace new and/or used components to reconstruct units to full operation. Students will be able to dismantle systems and to identify equipment breakdown.

**6. HOURS**

Classroom Theory/Applied	140
Community Classroom/Coop Voc Ed	160
<b>TOTAL HOURS</b>	<b>300</b>

**7. RECOMMENDED PREREQUISITE**

<b>Required</b>	Must be 16 years of age or older, a junior or senior in high school, an out-of-school youth, or an adult.
<b>Recommended</b>	Computer application skills.

**8. DATE REVISED February 2004  
UPDATED July 9, 2008**

9. COURSE OUTLINE			
A. Career Preparation Skills			
Class Hours	CC/CVE Hours	GENERAL WORKPLACE SKILLS	Standards
30	Integrated throughout the course	<ul style="list-style-type: none"> <li>• <b>Attitude and Work Habits</b> <ol style="list-style-type: none"> <li>1. Works both independently and collaboratively</li> <li>2. Attends regularly and on time</li> <li>3. Practices good safety procedures</li> <li>4. Solves problems thinks critically and makes good decisions</li> <li>5. Plans work and takes initiative</li> <li>6. Demonstrates leadership and the willingness to help train others</li> </ol> </li> <li>• <b>Job Employment Skills</b> <ol style="list-style-type: none"> <li>1. Develop a plan to achieve career goals</li> <li>2. Complete a career portfolio</li> <li>3. Use effective job search strategies</li> <li>4. Perform employment research</li> <li>5. Complete job application and resume</li> <li>6. Develop effective interviewing and follow-up skills.</li> <li>7. Demonstrate an awareness of importance of lifelong learning.</li> </ol> </li> </ul>	<p>CPS: Personal Skills; Interpersonal Skills</p> <p>SCANS: Personal Qualities; Interpersonal Qualities</p> <p>CPS: Employment Literacy</p>

**Sources:**  
 CPS - *Career Preparation Standards*. California Department of Education and WestEd  
 SCANS - *What Work Requires of Schools: A SCANS Report of America 2000*.  
 The Secretary's Commission on Achieving Necessary Skills, Publication of the US Dept. of Labor, June 1991.  
*Career Technical Education Model Curriculum Standards*. California Department of Education. May 2005

<b>B. Career Technical Skills</b>						
<b>Class Hours</b>	<b>CC/CVE Hours</b>	<b>CONTENT AREA SKILLS</b>	<b>Foundation Standards</b>	<b>Mention - M Reinforced - R Taught - T</b>	<b>CTE Pathway Standards</b>	<b>Mention - M Reinforced - R Taught - T</b>
10		<b>I. Computer Orientation</b>	* See attached pages that follow			
20	20	A. Students will become acquainted with the history and development of computer systems 1. Apply general computer terminology	4.1 (10) USH 11.8.7	T  R	B6.1	T
		<b>II. Basic Computer Operation</b>				
30	30	A. Students will be acquainted with basic computer operation, interface, and peripheral devices 1. Describe interaction of computer system, interface, and peripheral devices. 2. Describe concepts of microprocessors and hard drive memory. 3. Use DOS commands for maintenance and analysis. 4. Modify computer systems & auto exec functions. 5. Install hardware components	10.1  (9-10) LS 2.2  (9-10) R 2.1	R  R  R	B4.0  B4.4  B4.7  B4.1	T  T  T  T
		<b>III. Computer Device/Components</b>				
		A. Students will be introduced to individual components, microchips, microprocessors, interface and peripheral devices which comprise a personal computer system 1. Understand boot-up process. 2. Understand data storage and how disk drives work. 3. Dismantle a computer system and correctly identify composite components. 4. Correctly replace components 5. Install and operate drives for multi-media devices 6. Monitor - explain different kinds of monitors 7. Motherboard - identify the different form factors and CPU type mainboard and identify components on mainboard and their functions. 8. Explain the power requirement for each device in a PC system. 9. Basic Electronic Properties - explain basic transistor action in digital/binary circuits	4.0  (7) MR 2.5  (8) LS 2.4  (7) MR 2.5  (9-12) PH 3.a  (9-12) PH 3.c	T  M  M  M  M	10.3  10.1  B3.5  B3.6	T  T  T  T

Career Technical Skills						
Class Hours	CC/CVE Hours	CONTENT AREA SKILLS	Foundation Standards	Mention - M Reinforced - R Taught - T	CTE Pathway Standards	Mention - M Reinforced - R Taught - T
30	30	<b>IV. Hardware Knowledge</b>				
		A. Students should be able to				
		1. CPU - identify different brands/generations and explain the performance of each generation CPU.	(8) LS 2.2	R	B1.1	T
		2. Memory - identify SIMM and DIMM or RDRAM memory modules and correctly install memory modules without damage.			B4.0	T
		3. Input/Output Devices - install I/O devices (Keyboard, mouse, printers, scanners, etc.) and drivers if necessary.	(9-12) CRA 5.1	M		
		4. Storage devices - understand the operation of mass storage devices (HDD, ZIP drives, CD-RW, etc.) and install and operate mass storage devices.	(7-12) W 2.6	M		
30	20	<b>V. Diagnostic Procedures</b>				
		A. Students should be able to				
		1. Hand Tool - use proper hand tools (screw drivers, etc.) to assemble and disassemble PC systems.	(9-12) PH 3.a	M	B4.1 B4.6	T T
		2. ESD - explain the procedures to handle static sensitive electronic devices.				
		3. DMM - use digital multimeters to measure voltages and resistance in order to diagnose simple electronic circuits.	(9-12) PH 1.a	M	B3.0 B4.7	T T
		4. Boot Process/Beep Codes - locate the source of the problem by listening to the start up sequence beep code of a PC.				

Career Technical Skills						
Class Hours	CC/CVE Hours	CONTENT AREA SKILLS	Foundation Standards	Mention - M Reinforced - R Taught - T	CTE Pathway Standards	Mention - M Reinforced - R Taught - T
20	60	<b>VI. Software Installation</b>				
		A. Students should be able to				
		1. Basic DOS Functions - use DOS commands to install Operating System and start Operating System of PC.	4.2	T	B4.2	T
		2. BIOS - customize the performance of the PC by setting BIOS functions	10.1	T	B4.7	T
		3. Diagnostic - use utility software to optimize the operation of PC and perform scheduled maintenance.	10.3	T	B7.2	T
		4. Windows Operating System - install a Windows operating system from scratch or reinstall over existing OS.				
140	160	<b>Total Hours</b>				

## **C. Expected Student Proficiencies**

### **CAREER PREPARATION SKILLS**

- Identify appropriate careers and resources for training
- Identifies job resources
- Demonstrates interview skills
- Demonstrates knowledge of techniques for getting a job

### **HARDWARE KNOWLEDGE**

- Central Processing Unit
- Memory
- Input/Output Devices
- Physical Storage Devices
- Multi-Media Devices
- Monitors
- Motherboard
- Power Supply
- Basic Electronic Properties
- Basic Circuit Analysis

### **DIAGNOSTIC PROCEDURES**

- Proper Hand Tool Use
- ESD Precautions
- Boot Process/Beep Codes

### **SOFTWARE KNOWLEDGE**

- Basic DOS Function
- BIOS Functions
- Diagnostic Software (MSD, Norton's, Microscope 2000, etc.)
- Operating Systems

## 10. ADDITIONAL RECOMMENDED/OPTIONAL ITEMS

A. **Academic credit:** One year or 10 units

B. **Other – n/a**

**ARTICULATION** None

**UC APPROVAL** None

**INDUSTRY CERTIFICATION** None

C. **Instructional Strategies:**

- Lecture
- Demonstration
- Design problems and vocabulary
- Critical comparison
- Readings
- Project-based learning
- Work-based learning
- Guest presentations
- Group projects
- Field trips
- Videos
- Internet research
- Peer learning
- Lab Exercises

D. **Instructional Materials:** How Computers Work, ninth edition by Ron White. Published by Que

## 11. FOUNDATION (ACADEMIC) STANDARDS ALIGNED

### 1.0 Academics

Students understand the academic content required for entry into postsecondary education and employment in the Engineering and Design sector. *(The standards listed below retain in parentheses the numbering as specified in the mathematics, science, history–social science, and visual and performing arts content standards adopted by the State Board of Education.)*

#### Math

Specific applications of Number Sense standards (grade seven):

- (1.1) Read, write, and compare rational numbers in scientific notation (positive and negative powers of 10) with approximate numbers using scientific notation.
- (1.3) Convert fractions to decimals and percents and use these representations in estimations, computations, and applications.
- (1.6) Calculate the percentage of increases and decreases of a quantity.

Specific applications of Mathematical Reasoning standards (grade seven):

- (2.1) Use estimation to verify the reasonableness of calculated results.
- (2.2) Apply strategies and results from simpler problems to more complex problems.
- (2.7) Indicate the relative advantages of exact and approximate solutions to problems and give answers to a specified degree of accuracy.
- (2.8) Make precise calculations and check the validity of the results from the context of the problem.

#### Algebra I

Specific applications of Algebra I standards (grades eight through twelve):

- (13.0) Students add, subtract, multiply, and divide rational expressions and functions. Students solve both computationally and conceptually challenging problems by using these techniques.

#### Science

Specific applications of Investigation and Experimentation standards (grades nine through twelve):

- (1.a) Select and use appropriate tools and technology (such as computer-linked probes, spreadsheets, and graphing calculators) to perform tests, collect data, analyze relationships, and display data

#### History/Social Science

Specific applications of World History, Culture and Geography: The Modern World standards (grade ten):

- (10.3) Students analyze the effects of the Industrial Revolution in England, France, Germany, Japan, and the United States.
  - (10.3.2) Examine how scientific and technological changes and new forms of energy brought about massive social, economic, and cultural change (e.g., the inventions and discoveries of James Watt, Eli Whitney, Henry Bessemer, Louis Pasteur, Thomas Edison).
- (11.11.3) Describe the changing roles of women in society as reflected in the entry of more women into the labor force and the changing family structure.

Specific applications of Principles of Economics standards (grade twelve):

- (12.4.2) Describe the current economy and labor market, including the types of goods and services produced, the types of skills workers need, the effects of rapid technological change, and the impact of international competition.
- (12.4.3) Discuss wage differences among jobs and professions, using the laws of demand and supply and the concept of productivity.

### 2.0 Communications

Students understand the principles of effective oral, written, and multimedia communication in a variety of formats and contexts. *(The standards listed below retain in parentheses the numbering as specified in the English–language arts content standards adopted by the State Board of Education.)*

#### Reading

Specific applications of Reading Comprehension standards (grades nine and ten):

- (2.1) Analyze the structure and format of functional workplace documents, including the graphics and headers, and explain how authors use the features to achieve their purposes.
- (2.2) Prepare a bibliography of reference materials for a report using a variety of consumer, workplace, and public documents.
- (2.3) Generate relevant questions about readings on issues that can be researched.
- (2.6) Demonstrate use of sophisticated learning tools by following technical directions (e.g., those found with graphic calculators and specialized software programs and in access guides to World Wide Web sites on the Internet).

#### Writing

Specific applications of Writing Strategies and Applications standards (grades nine and ten):

- (2.3) Write expository compositions, including analytical essays and research reports:
- b. Convey information and ideas from primary and secondary sources accurately and coherently.
  - d. Include visual aids by employing appropriate technology to organize and record information on charts, maps, and graphs.
  - f. Use technical terms and notations accurately.
- (2.6) Write technical documents (e.g., a manual on rules of behavior for conflict resolution, procedures for conducting a meeting, minutes of a meeting):

Specific applications of Writing Strategies and Applications standards (grades eleven and twelve):

- (1.8) Integrate databases, graphics, and spreadsheets into word-processed documents.
- (2.5) Write job applications and résumés:
- a. Provide clear and purposeful information and address the intended audience appropriately.
  - b. Use varied levels, patterns, and types of language to achieve intended effects and aid comprehension.
  - c. Modify the tone to fit the purpose and audience.
  - d. Follow the conventional style for that type of document (e.g., résumé, memorandum) and use page formats, fonts, and spacing that contribute to the readability and impact of the document.
- (2.6) Deliver multimedia presentations:
- a. Combine text, images, and sound and draw information from many sources (e.g., television broadcasts, videos, films, newspapers, magazines, CD-ROMs, the Internet, electronic media-generated images).
  - b. Select an appropriate medium for each element of the presentation.
  - c. Use the selected media skillfully, editing appropriately and monitoring for quality.

#### Written & Oral English Language Conventions

Specific applications of English Language Conventions standards (grades nine and ten):

- (1.3) Demonstrate an understanding of proper English usage and control of grammar, paragraph and sentence structure, diction, and syntax.
- (1.4) Produce legible work that shows accurate spelling and correct use of the conventions of punctuation and capitalization.

#### Listening & Speaking

Specific applications of Listening and Speaking Strategies and Applications standards (grade nine and ten):

- (2.3) Apply appropriate interviewing techniques:
- a. Prepare and ask relevant questions.
  - c. Use language that conveys maturity, sensitivity, and respect.
  - d. Respond correctly and effectively to questions.
  - e. Demonstrate knowledge of the subject or organization.
  - g. Evaluate the effectiveness of the interview.
- (2.4) Deliver multimedia presentations:
- a. Combine text, images, and sound by incorporating information from a wide range of media, including films, newspapers, magazines, CD-ROMs, online information, television, videos, and electronic media-generated images.

**3.0 CAREER PLANNING & MANAGEMENT**

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

- 3.1 Know the personal qualifications, interests, aptitudes, knowledge, and skills necessary to succeed in careers.
- 3.2 Understand the scope of career opportunities and know the requirements for education, training, and licensure.
- 3.3 Develop a career plan that is designed to reflect career interests, pathways, and postsecondary options.
- 3.4 Understand the role and function of professional organizations, industry associations, and organized labor in a productive society.
- 3.5 Understand the past, present, and future trends that affect careers, such as technological developments and societal trends, and the resulting need for lifelong learning.
- 3.6 Know important strategies for self-promotion in the hiring process, such as job applications, résumé writing, interviewing skills, and preparation of a portfolio.
- 3.7 Explore career opportunities in business through such programs as virtual enterprise, work experience, and internships.

**4.0 TECHNOLOGY**

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

- 4.1 Understand past, present, and future technological advances as they relate to a chosen pathway.
- 4.2 Understand the use of technological resources to gain access to, manipulate, and produce information, products, and services.
- 4.3 Understand the influence of current and emerging technology on selected segments of the economy.
- 4.4 Understand effective technologies used in Web site development and the Internet.
- 4.5 Know procedures for maintaining secure information, preventing loss, and reducing risk.

**5.0 PROBLEM SOLVING & 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:

- 5.1 Apply appropriate problem-solving strategies and critical thinking skills to work-related issues and tasks.
- 5.2 Understand the systematic problem-solving models that incorporate input, process, outcome, and feedback components.
- 5.3 Use critical thinking skills to make informed decisions and solve problems.
- 5.4 Understand how financial systems and tools are used to solve business problems.

**6.0 HEALTH & SAFETY**

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

- 6.1 Know the policies, procedures, and regulations regarding health and safety in the workplace, including employers' and employees' responsibilities.
- 6.2 Understand critical elements for health and safety practices related to storing, cleaning, and maintaining tools, equipment, and supplies.
- 6.3 Understand the environmental and ergonomic risks associated with the use of business equipment and the financial impact of an unsafe work environment.

**7.0 RESPONSIBILITY & FLEXIBILITY**

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

- 7.1 Understand the qualities and behaviors that constitute a positive and professional work demeanor.
- 7.2 Understand the importance of accountability and responsibility in fulfilling personal, community, and workplace roles.
- 7.3 Understand the need to adapt to varied roles and responsibilities.
- 7.4 Understand that individual actions can affect the larger community.

**8.0 ETHICS & LEGAL RESPONSIBILITY**

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

- 8.1 Know the major local, district, state, and federal regulatory agencies and entities that affect the industry and how they enforce laws and regulations.
- 8.2 Understand the concept and application of ethical and legal behavior consistent with workplace standards.
- 8.3 Understand the role of personal integrity and ethical behavior in the workplace.
- 8.4 Understand major local, state, and federal laws and regulations that affect business as well as the procedural requirements necessary for compliance.
- 8.5 Know how to design systems and applications to allow access to all users.

**9.0 LEADERSHIP & TEAMWORK**

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

- 9.1 Understand the characteristics and benefits of teamwork, leadership, and citizenship in the school, community, and workplace settings.
- 9.3 Understand how to organize and structure work individually and in teams for effective performance and the attainment of goals.
- 9.4 Know multiple approaches to conflict resolution and their appropriateness for a variety of situations in the workplace.
- 9.5 Understand how to interact with others in ways that demonstrate respect for individual and cultural differences and the attitudes and feelings of others.

**10.0 TECHNICAL KNOWLEDGE & SKILLS**

- 10.1 Know how to use a variety of business- and industry-standard software and hardware, including major proprietary and open standards.
- 10.2 Understand the information technology components of major business functions (e.g., marketing, accounting, and human resource management) and their interrelationships.
- 10.3 Understand the economic effects of technology on a business in the global marketplace.
- 10.4 Know how financial systems and tools are used to perform business transactions through the use of technology.
- 10.5 Use technology and electronic media to manage the work flow and to provide feedback.
- 10.6 Understand the interrelationships between hardware components and supportive software.
- 10.7 Analyze the functions, features, and limitations of different operating systems, environments, applications, and utilities.
- 10.8 Know how to use appropriate help resources (e.g., help desks, online help, manuals) to install, configure, upgrade, diagnose, and repair operating systems, environments, applications, and utilities.

**11.0 DEMONSTRATION & APPLICATION**

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

**12. B. Computer Hardware, Electrical, and Networking Engineering Pathway**

The Computer Hardware, Electrical, and Networking Engineering Pathway provides learning opportunities for students interested in preparing for careers in the assembly, manufacturing, programming, design, production, and maintenance of information technology, computer, telecommunications, and networking systems.

*B1.0 Students know how to communicate and interpret information clearly in industry standard visual and written formats:*

- B1.1 Understand the classification and use of various electronic components, symbols, abbreviations, and media common to electronic drawings.
- B1.2 Plan, prepare, and interpret mechanical, civil, chemical, and electrical sketches and drawings.
- B1.3 Know the current industry standards for illustration and layout.
- B1.4 Understand, organize, and complete network diagrams by using information

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collected from detailed drawings.

B1.5 Draw flat layouts of a variety of objects by using the correct drafting tools, techniques, and media.

B1.6 Prepare reports and data sheets for writing specifications.

*B2.0 Students understand the telecommunications systems, such as electromagnetic, fiber optic, and digital, that apply to the transmission of data:*

B2.1 Understand how to confirm operating parameters, apply test procedures, make necessary adjustments, and assemble the components of a telecommunications system or subsystem.

B2.2 Understand how to plan, install, and maintain copper and fiber optic cabling for telecommunications systems.

B2.3 Test and maintain wireless communications components and systems.

B2.4 Understand how to safely operate various data networking and telecommunications systems.

*B3.0 Students know the fundamentals of the theory, measurement, control, and applications of electrical energy, including alternating and direct currents:*

B3.1 Analyze relationships between voltage, current, resistance, and power related to direct current (DC) circuits.

B3.2 Understand the characteristics of alternating current (AC) and how AC is generated; the characteristics of the sine wave; the basic characteristics of AC circuits, tuned circuits, and resonant circuits; and the nature of the frequency spectrum.

B3.3 Calculate, construct, measure, and interpret both AC and DC circuits.

B3.4 Understand the fabrication processes and how they are applied in the electronics industry.

B3.5 Use appropriate electronic instruments to analyze, repair, or measure electrical and electronic systems, circuits, or components.

B3.6 Analyze and predict the effects of circuit conditions on the basis of measurements and calculations of voltage, current, resistance, and power.

*B4.0 Students understand computer systems and solve computer-related problems from an engineering perspective:*

B4.1 Understand how to design and assemble systems that use computer programs to interact with hardware.

B4.2 Install and configure essential computer hardware and software components.

B4.3 Understand the ethical issues in computer engineering.

B4.4 Know the function and interaction of basic computer components and peripherals.

B4.5 Understand the relationship among computer hardware, networks, and operating systems.

B4.6 Understand the process of assembling, testing, and troubleshooting computer equipment and systems.

B4.7 Use utility software and test equipment efficiently to diagnose and correct problems.

*B5.0 Students understand the design process and how to solve analysis and design problems:*

B5.1 Understand the steps in the design process.

B5.2 Determine what information and principles are relevant to a problem and its analysis.

B5.3 Choose between alternate solutions in solving a problem and be able to justify the choices made in determining a solution.

B5.4 Translate word problems into mathematical statements when appropriate.

B5.5 Understand the process of incorporating multiple details into a single solution.

B5.6 Build a prototype from plans and test it.

B5.7 Evaluate and redesign a prototype on the basis of collected test data.

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***B6.0 Students understand the principles of data systems networking (e.g., design, configuration topology, and implementation):***

- B6.1 Understand the terminology used in the design, assembly, configuration, and implementation of data systems networks.
- B6.2 Know the fundamental elements of the major networking models established by the industry standards of recognized organizations (e.g., the Open System Interconnect [OSI] or transmission-control/Internet protocol [TCP/IP] models).
- B6.3 Know how data are carried through the most common network media.
- B6.4 Understand the composition and function of the various networks, including local area networks
- B6.5 Use the major routing and addressing protocols used in networking.
- B6.6 Understand the characteristics, advantages, and disadvantages of the various networking presentation functions (e.g., data formatting, data encryption, and data compression).
- B6.7 Know the characteristics of networking hardware and applications and the methods to implement them.
- B6.8 Design and document data systems networks.

***B7.0 Students understand how to define a network security plan:***

- B7.1 Know the common potential threats to networks and ways to neutralize them.
- B7.2 Know the main functions of and installation protocols for firewalls, virus detection software, and other security measures.
- B7.3 Upgrade and patch operating systems as necessary.
- B7.4 Define and configure firewalls.
- B7.5 Detect and remove virus and worm threats.
- B7.6 Use a management plan to develop an acceptable-use policy.

***B8.0 Students understand fundamental automation modules and know how to set up simple systems to complete preprogrammed tasks:***

- B8.1 Use appropriate tools and technology to install equipment, assemble hardware, perform tests, collect data, analyze relationships, and display data in a simulated or modeled automated system.
- B8.2 Understand the use of sensors for data collection and process correction in an automated system.
- B8.3 Understand

***B9.0 Students understand the effective use of computer and networking equipment:***

- B9.1 Use methods and techniques for employing all computer and networking equipment appropriately.
- B9.2 Apply conventional computer and networking processes and procedures accurately, appropriately, and safely.
- B9.3 Apply the concepts of computer and networking equipment to the tools, equipment, projects, and procedures of the Computer Hardware, Electrical, and Networking Engineering Pathway.

## LEGEND FOR REFERENCE OF ACADEMIC STANDARDS

Parenthetical notation preceding the content standard item refers to the grade level for the standard. i.e. (8) refers to grade 8, (9-10) refers to grades 9 & 10.

Example: (8) W2.1 refers to the Eighth Grade Writing Standard Item 2.1

### English-Language Arts:

R Reading  
W Writing  
WOC Written & Oral Conventions  
LS Listening & Speaking

### Mathematics:

NS Number Sense  
AF Algebra & Functions  
SDP Statistics, Data Analysis & Probability  
MR Mathematical Reasoning  
MG Measurement & Geometry  
AI Algebra I  
G Geometry  
AII Algebra II  
P&S Probability & Statistics  
APP&S Advanced Placement Probability & Statistics  
C Calculus

### Science:

PH Physics  
CH Chemistry  
ES Earth Science  
I&E Investigation and Experimentation

### History-Social Science:

WH World History, Culture and Geography  
USH United States History and Geography  
AD American Democracy  
ECON Economics

### Visual and Performing Arts:

APP: Artistic Perception Proficient Level  
APA: Artistic Perception Advanced

CEP: Creative Expression Proficient  
CEA: Creative Expression Advanced  
HCCP: Historical & Cultural Proficient  
HCCA: Historical & Cultural Advanced  
AVP: Aesthetic Valuing Proficient  
AVA: Aesthetic Valuing Advanced  
CRP: Connections, Relationships, Proficient  
CRA: Connections, Relationships, Advanced

### ELA: English-Language Arts with in VPA

ELA- LRA: Literary Response and Analysis  
ELA-WSA: Writing Strategies & Applications  
ELA-WOELC: Written & Oral English Language Conventions

### Sectors

AME Arts, Media and Entertainment  
BTC Building Trades and Construction  
ECDFS Education, Child Development & Family Services  
EU Energy & Utilities  
ED Engineering & Design  
FID Fashion and Interior Design  
FAB Finance and Business  
HSMT Health Science & Medical Technology  
HTR Hospitality, Tourism & Recreation  
IT Information Technology  
MPD Manufacturing and Product Development  
MSS Marketing, Sales, & Services  
PS Public Services  
T Transportation