

ARIZONA CTE CAREER PREPARATION STANDARDS & MEASUREMENT CRITERIA

DRAFTING AND DESIGN TECHNOLOGY Electronics Drafting, 15.1300.30	
STANDARD 1.0—APPLY MEASUREMENT AND SCALE CONCEPTS IN DESIGN DRAFTING	
1.1	Identify types of measurement used in design drafting
1.2	Select proper measurement tools
1.3	Perform measurements with hand held instruments
1.4	Determine and apply appropriate scale
1.5	Transcribe illustrations accurately
STANDARD 2.0—INTERPRET ENGINEERING DOCUMENTS AND CONTROL DOCUMENTS	
2.1	Interpret dimensions, symbols, legends, scales, and directions/orientations
2.2	Analyze how content and information are communicated in schematics, blueprints, and technical drawings
2.3	Analyze schematics, blueprints, and technical drawings for clarity, completeness, and accuracy
2.4	Recognize cross-referencing on technical drawings
2.5	Identify and describe basic types of drawings by trade
2.6	Locate and interpret information on specific documents
2.7	Check prints for dimensional accuracy, completeness, and note detail
2.8	Compare schematics to dimensional drawings
2.9	Verify drawing elements
2.10	Identify conflicting data
STANDARD 3.0—CREATE TECHNICAL DRAWINGS	
3.1	Identify, select, and use fundamental drafting techniques for drawings
3.2	Demonstrate freehand lettering technique
3.3	Identify "Alphabet of Lines" by name, line type variation, order of usage and application on technical drawings
3.4	Create title blocks

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3.5	Format borders
3.6	Apply notes and dimensions
3.7	Plot or print drawings using correct layout
3.8	Organize and maintain drawings and supporting documents
STANDARD 4.0—UTILIZE BASIC COMPUTER CONCEPTS, OPERATIONS, AND INFORMATION TECHNOLOGY APPLICATIONS	
4.1	Use computer hardware and input/output devices for design drafting problems
4.2	Apply basic commands of operating system software
4.3	Apply file and disk management techniques
4.4	Import and export data files using different formats (dxf, dxb, Tiff, gif, pcx, eps, spd, or other formats as required)
4.5	Prepare files for electronic transfer
4.6	Access and use the Internet for file transfer
4.7	Access and use a computer network for file management and transfer
STANDARD 5.0—USE A CADD/VDCM (VIRTUAL DESIGN AND CONSTRUCTION MODELING) SYSTEMS AND PROCEDURES	
5.1	Explore and determine applicability of CADD/VDCM systems to the project
5.2	Analyze drawings using CADD/VDCM software functions/commands
5.3	Use CADD/VDCM software commands to set up drawing scale, format, dimensioning, etc.
5.4	Apply layers/visible items, colors, line types, editing commands, and grouping techniques
5.5	Control entity properties
5.6	Incorporate standard parts, symbol libraries, and/or templates
5.7	Control viewing commands
5.8	Create and manipulate views by modifying coordinate system settings
5.9	Minimize a drawing file for storage and transmission

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STANDARD 6.0—DETAIL PROJECTION VIEWS/COMPONENTS	
6.1	Determine views for projection (i.e., plan, top, front, etc.)
6.2	Identify, create, and place views for orthographic features
6.3	Identify, create, and place auxiliary views to determine true size, shape, and location of non-orthogonal features
6.4	Identify, create, and place appropriate section views
6.5	Construct full, half, and offset section of an object
6.6	Utilize various material hatch patterns in section views
STANDARD 7.0c—UTILIZE ELECTRICAL/ELECTRONICS DRAFTING/DESIGN CONCEPTS AND PROBLEMS	
7.1c	Use electrical/electronics terminology in context
7.2c	Identify and apply electrical/electronic symbols
7.3c	Solve problems using Ohm's law
7.4c	Use industry-standards, codes, and regulations application software for electrical/electronics drafting to solve a problem
7.5c	Evaluate accuracy of electrical/electronics drawings
STANDARD 8.0c—DEMONSTRATE DRAFTING/DESIGN CONCEPTS AS RELATED TO PRINTED CIRCUIT BOARD (PCB) DESIGN	
8.1c	Draft a logic diagram
8.2c	Identify symbols in a schematic
8.3c	Design schematics to and from specifications
8.4c	Draw a harness layout
8.5c	Prepare wiring diagrams
8.6c	Determine minimum board size

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8.7c	Prepare single-sided PCB layout drawing
8.8c	Prepare double-sided to multi-layered PCB layout drawings
8.9c	Prepare an assembly drawing
8.10c	Design circuit board artwork
STANDARD 9.0c—DEMONSTRATE DESIGN DRAFTING CONCEPTS AS RELATED TO INTEGRATED CIRCUIT (IC) DESIGN	
9.1c	Identify analog and digital gate and transistor device symbols
9.2c	Sketch analog symbols (capacitor, resistor)
9.3c	Sketch digital symbols at gate and transistor levels
9.4c	Draft common IC layout structures (resistors, capacitors, digital gates, etc)
9.5c	Prepare sketches of pin configurations and gate locations
9.6c	Explain basic logic operations
9.7c	Draft a logic diagram
9.8c	Diagram schematics

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