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| **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 | |
| 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 |