

# Learning Standards for the Drafting Program of Study

Mt. Hood CTE Consortium

(The following list was created/edited by teachers at the secondary and post-secondary level in conjunction with local industry partners. These learning standards represent the common core that all teachers in the region will be responsible for teaching during the entire high school program of study.)

- A**                    **FUNDAMENTAL DRAFTING SKILLS**
- A     01     Use drawing media and related drafting materials
- A     02     Use basic measurement systems
- A     03     Add correct annotation to drawing
- A     04     Identify line styles and weights
- A     05     Prepare title blocks and other drafting formats
- A     06     Apply metric and/or dual dimensioning drawing standards
- A     07     Identify and use appropriate standard symbols
- A     08     Demonstrate reproduction of originals using different methods
  
- B**                    **FUNDAMENTAL ORTHOGRAPHIC PROJECTIONS**
- B     01     Identify, create, and place appropriate orthographic views
- B     02     Identify, create, and place appropriate auxiliary views
- B     03     Identify, create, and place appropriate section views
  
- C**                    **FUNDAMENTAL PICTORIAL DRAWINGS**
- C     01     Identify and create axonometric drawings
- C     02     Identify and create oblique drawings
- C     03     Identify perspective drawings
  
- D**                    **FUNDAMENTAL DIMENSIONING**
- D     01     Apply dimensioning rules
- D     02     Use dimension line terminators
- D     03     Dimension objects
- D     04     Dimension complex shapes
- D     05     Dimension features from a center line
- D     06     Dimension a theoretical point of intersection
- D     07     Use dual dimensioning standards
- D     08     Use size and location dimension practices
- D     09     Use various dimensioning styles
- D     10     Place tolerance dimensioning and geometric dimensioning and tolerancing
  
- E**                    **FUNDAMENTAL COMPUTER HARDWARE SKILLS**
- E     01     Demonstrate proper care of equipment
- E     02     Operate and adjust input devices
- E     03     Operate and adjust output devices

- E 04 Demonstrate correct handling and operation of storage media
- E 05 Start and shut down work station
- E 06 Adjust monitor controls for maximum comfort and usability
- E 07 Access electronic information services
  
- F** **PHYSICAL AND SAFETY NEEDS**
- F 01 Demonstrate an understanding of workstation ergonomic considerations
- F 02 Demonstrate personal safety practices
  
- G** **COMPUTER OPERATION SYSTEMS SKILLS**
- G 01 Start and exit a software program as required
- G 02 Demonstrate file management techniques
- G 03 Format floppy disk
- G 04 Identify, create, and use directory structure and change directory paths
- G 05 Demonstrate file maintenance and back up procedures
- G 06 Translate, import, and export data files between formats
- G 07 Use on-line help
- G 08 Save drawings to storage devices
  
- H** **BASIC CADD CREATE**
- H 01 Create a new drawing
- H 02 Perform drawing setup
- H 03 Use associative dimensioning
- H 04 Create geometric figures
- H 05 Create text using appropriate style and size to annotate drawings
- H 06 Use and control accuracy enhancement tools
- H 07 Identify, create, store, and use appropriate symbols/libraries
- H 08 Create wireframe/solid models
- H 09 Create objects using primitives
- H 10 Create 2D geometry from 3D models
- H 11 Revolve a profile to create a 3D object
- H 12 Create 3D wireframe models from 2D geometry
  
- I** **BASIC CADD**
- I 01 Utilize geometry editing commands
- I 02 Utilize non-geometric editing commands
  
- J** **BASIC CADD MANIPULATE**
- J 01 Control coordinates and display scale
- J 02 Control entity properties
- J 03 Use viewing commands
- J 04 Use display commands
- J 05 Use standard parts and/or symbol libraries
- J 06 Plot drawing on media using correct layout and scale
- J 07 Use layering techniques
- J 08 Use grouping techniques

J 09 Minimize file size

**K ADVANCED CADD CREATE**

- K 01 Create wireframe or solid models
- K 02 Create non-analytic surfaces using modeling
- K 03 Create analytic surfaces using modeling with planes and analytic curves
- K 04 Create offset surfaces
- K 05 Find intersection of two surfaces
- K 06 Create joined surfaces
- K 07 Create a fillet or blend between two surfaces
- K 08 Create feature based geometry
- K 09 Create cut sections
- K 10 Construct and label exploded assembly drawings
- K 11 Perform Boolean operations

**L ADVANCED CADD EDIT**

- L 01 Trim surface
- L 02 Manipulate surface normals
- L 03 Extend surface
- L 04 Edit control points
- L 05 Modify geometry using Boolean operations
- L 06 Edit primitives

**M ADVANCED CADD MANIPULATE**

- L 01 Perform axis view clipping
- L 02 Extract wireframe data from surface/solid geometry
- L 03 Shade/Render object

**N ADVANCED CADD ANALYZE**

- N 01 Use query commands to interrogate database
- N 02 Extract geometric data
- N 03 Extract attribute data
- N 04 Identify gaps in nonintersecting surfaces
- N 05 Obtain surface properties
- N 06 Obtain mass properties data

**O CADD PRODUCTIVITY AND WORK HABITS**

- O 01 Perform CADD program customization to improve productivity
- O 02 Manipulate associated non-graphical data
- O 03 Use template and library files to establish drawing presets
- O 04 Develop geometry using parametric programs

**P INTERPRET THE ENGINEERING DESIGN PROCESS**

- P 01 Identify a design process
- P 02 Identify activities that occur during each phase of the design process
- P 03 Describe how social, environmental, and financial constraints influence the design process

- P 04 List tools needed for a manufactured product
- P 05 Analyze a product for design flaws

**Q DEMONSTRATE MEASURING AND SCALING TECHNIQUES**

- Q 01 Identify industry standard units of measure
- Q 02 Convert between industry standard units of measure
- Q 03 Determine appropriate engineering scales
- Q 04 Determine and apply the equivalence between fractions and decimals
- Q 05 Demonstrate proper use of precision measuring tools

**R UTILIZE ENGINEERING DOCUMENTATION PROCEDURES**

- R 01 Demonstrate record keeping procedures and communication in engineering
- R 02 Illustrate project management timelines

**S DEMONSTRATE MODELING TECHNIQUES**

- S 01 Create a scale model or working prototype
- S 02 Evaluate a scale model or a working prototype
- S 03 Identify methods and sources for obtaining materials and supplies

**T ANALYZE BUILDING DESIGN AND CONSTRUCTION SYSTEMS**

- T 01 Model a small residential building utilizing architectural design software

**U UTILIZE RESIDENTIAL DESIGN CONCEPTS**

- U 01 Utilize client requirements and specifications to create a plan set
- U 02 Identify foundation types for a residential structure
- U 03 Create a set of residential construction drawings