

Learning Standards for the Metals 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 THE STUDENT WILL DEMONSTRATE KNOWLEDGE OF AND APPLY PERSONAL PROTECTIVE SAFETY EQUIPMENT APPROPRIATE TO THE PROCESS

- A 01 Demonstrate knowledge of and apply appropriate clothing protection appropriate to the task
- A 02 Locate and properly use protective equipment
- A 03 Identify hazardous and non-hazardous materials
- A 04 Demonstrate knowledge of and apply appropriate handling, lifting and transport of materials (hazardous and non-hazardous)

B THE STUDENT WILL DEMONSTRATE PROPER INDUSTRIAL SAFETY PRACTICES AND PROCEDURES IN A MANUFACTURING FACILITY

- B 01 Maintain and use appropriate protective guards and equipment on machinery
- B 02 Select appropriate tool for the task
- B 03 Conduct pre-use inspection and set-up of tools
- B 04 Use the tool properly (hand placement, min. and max. material sizes, feed rates)
- B 05 Be able to distinguish between properly and improperly functioning tools
- B 06 Demonstrate maintenance of the tool (cleaning, lubrication, sharpening)

C THE STUDENT WILL DEMONSTRATE PROPER USE OF EMERGENCY EQUIPMENT AND PROCEDURES

- C 01 Demonstrate knowledge of proper use of fire extinguisher
- C 02 Demonstrate knowledge of and apply evacuation procedures
- C 03 Demonstrate knowledge of basic first aid to cuts and burns, eye wash, and blood-borne pathogens

D THE STUDENT WILL USE BASIC MATH AND MEASURING SKILLS

- D 01 Demonstrate proper use of measuring devices
- D 02 Identify and apply appropriate unit of measurement
- D 03 Able to measure to a specified tolerance
- D 04 Convert fractions/decimals/metric
- D 05 Apply appropriate calculation to the task (add, subtract, multiply, divide)

E THE STUDENT WILL DEMONSTRATE KNOWLEDGE AND SKILLS SPECIFIC TO THE PATHWAY

- E 01 Student demonstrates a knowledge of the different career paths and opportunities within a pathway

E 02 The student will demonstrate proper use of the tool in completing a specific process

F PERFORM SAFETY, HEALTH, INSPECTION, AND REPAIR PROCESSES RELATED TO WELDING AND THERMAL CUTTING

F 01 Make minor external repairs to equipment and accessories

F 02 Understand precautionary labeling

G PERFORM OPERATIONS RELATED TO SHOP EQUIPMENT USED IN WELDING, LAYOUT, AND PART PREPARATION

G 02 Perform shearing operations

H PERFORM ENTRY LEVEL WELDING PROCESSES USING A CARIETY OF WELDING TECHNOLOGIES INCLUDING SHIELDED METAL ARC WELDING (SMAW), GAS ARC WELDING (GMAW), AND GAS TUNGSTEN WELDING (GTAW)

H 01 Make fillet welds, on plain carbon steel using GMAW short circuit transfer

H 02 Make groove welds, all positions, on plain carbon steel using GMAW short circuit transfer

I THE STUDENT WILL IDENTIFY WELDING TOOLS AND EQUIPMENT

I 01 Identify basic hand tools (chipping hammers, brushes, files, strikers)

I 02 Identify basic power tools (grinders, drills)

J THE STUDENT WILL DEMONSTRATE KNOWLEDGE OF WELDING PROCESSES

J 01 Identify and describe different welding processes (SMAW, GMAW, GTAW, OXYFUEL welding)

J 02 Identify welding positions according to AWS standards (flat, vertical, horizontal, overhead, IG- 4G, and 1G/F)

J 03 Identify joint types (butt, lap, T, corner, edge)

J 04 Identify cutting processes (plasma, oxyfuel)

K THE STUDENT WILL BE ABLE TO INTERPRET DRAWINGS, PLANS AND CONTROL DOCUMENTS

K 01 Interpret welding prints to determine tolerance dimensions in decimal, fractions, and degrees

K 02 Identify the basic components of a blueprint

K 03 Identify and interpret basic welding symbols

L THE STUDENT WILL BE ABLE TO IDENTIFY GENERALLY USED WELDING MATERIALS

L 01 Identify key welding materials include ferrous and non-ferrous materials (steel, aluminum, stainless steel, high-carbon steel, low-carbon steel, cast iron)

L 02 Identify structural steel shapes (channel, angle, tubing, I-beam, H-beam, sheeting, plate) 5 Graphic Questions

L 03 Select the material for the appropriate application

M THE STUDENT WILL DEMONSTRATE ABILITY TO PLAN AND COMPLETE CORE WELDING PROCESSES

M 01 Select appropriate welding process for the specified thickness/gauge of material being used

M 02 Identify appropriate electrodes and filler materials for the specific process

M 03 Perform safety inspections of equipment and accessories used in the welding process

N THE STUDENT WILL DEMONSTRATE PROPER USE OF THE EQUIPMENT USED TO CONDUCT SHIELDED METAL ARC WELDING PROCESSES IN THE FLAT AND HORIZONTAL POSITIONS, AT MINIMUM

N 01 Demonstrate proper set-up procedures for shielded metal arc welding operations on plain carbon steel

N 02 Start and restart an arc, maintain a stable arc while running a bead, backfill the crater at the restart and at the end of the bead, while running a bead on mild steel plate

N 03 Complete welds in the 1G/F (flat) and 2G/F (horizontal) positions using appropriate electrodes on mild steel, at minimum