# Sheet Metal Technology Course No. 13205 Credit: 0.5

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| **Student name:** |  | **Graduation Date:** |  |

Pathways and CIP Codes:Construction and Design (46.0000) - Construction Strand; Manufacturing (48.0000) - Maintenance Strand

Course Description: **Application Level:** An application level course designed to provide students with exposure to and training in the theories, equipment, and skills needed to perform sheet metal layout and fabrication techniques. (SCED: Sheet Metal courses expose students to the skills and information necessary to lay out, fabricate, assemble, install, maintain, and repair items and structures created from sheet metal components. Students learn the safe and efficient operation of various tools and typically gain skill in blueprint reading, welding, and finishing and polishing metals.)

Directions:The following competencies are required for full approval of this course. Check the appropriate number to indicate the level of competency reached for learner evaluation.

**RATING SCALE:**

4. Exemplary Achievement: Student possesses outstanding knowledge, skills or professional attitude.

3. Proficient Achievement:Student demonstrates good knowledge, skills or professional attitude. Requires limited supervision.

2. Limited Achievement:Student demonstrates fragmented knowledge, skills or professional attitude. Requires close supervision.

1. Inadequate Achievement:Student lacks knowledge, skills or professional attitude.

0. No Instruction/Training:Student has not received instruction or training in this area.

**Prerequisite:** 17062 MEP 1 or Concurrent with 17056 HVAC Technology (Construction Pathway)

## Benchmark 0: The following competencies are to be taught within ALL application level courses offered in your school's approved pathway.

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 1.1 | Demonstrate an understanding of industry standards for personal safety including the safe use of tools, equipment and hazardous materials |  |
| 1.2 | Demonstrate Time Management Skills |  |
| 1.3 | Create and utilize employment documents including a resume and portfolio. |  |
| 1.4 | Demonstrate job seeking and interview skills. |  |
| 1.5 | Understand and respond to performance reviews. |  |

## Benchmark 1: Shop and Machine-Specific Safety

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 1.1 | Safely utilize and maintain tools common to the sheet metal trade. |  |
| 1.2 | Describe types and thicknesses of sheet metal. |  |
| 1.3 | Explain and identify accident causes in the sheet metal industry. |  |
| 1.4 | Describe safe working attire in the sheet metal industry. |  |
| 1.5 | Demonstrate safe use of tools and equipment. |  |

## Benchmark 2: Sheet Metal Tools and Materials

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 2.1 | Describe terms and definitions related to sheet metal fabrication and layout. |  |
| 2.2 | Discuss the sheet metal forming equipment and their applications. |  |

## Benchmark 3: Print Reading, Measuring, and Math Skills

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 3.1 | Demonstrate print reading skills including the interpretation of plans, elevations, schedules, and details. |  |
| 3.2 | Identify the three basic types of layout: parallel line, radial line, and triangulation. |  |
| 3.3 | Utilize a tape measure to obtain correct measurements for a ductwork detail. |  |
| 3.4 | Calculate circumference and area of a circle. |  |
| 3.5 | Demonstrate architect's scale use in sheet metal. |  |
| 3.6 | Describe measuring tools. |  |

## Benchmark 4: Sheet Metal Layout and Fabrication

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 4.1 | Discuss terms and definitions. |  |
| 4.2 | Use various sheet metal equipment to build projects. |  |
| 4.3 | Use various sheet metal hand tools. |  |
| 4.4 | Layout and use the squaring metal shear to cut sheet metal. |  |
| 4.5 | Fasten sheet metal using different bonding methods (e.g. adhesives, fasteners or spot welding). |  |
| 4.6 | Layout and fabricate a basic joint of ductwork (e.g. Rivets and Fasteners) |  |
| 4.7 | Layout and fabricate basic sheet metal fittings. |  |
| 4.8 | Describe the different seams commonly used for ductwork and explain the advantages of each. |  |
| 4.9 | Produce sheet metal/duct work project utilizing concepts and skills. |  |

## Benchmark 5: Sheet Metal Notching and Use of Forming Machines

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 5.1 | Fasten sheet metal together using the Snap-lock machine and the Pittsburg machine. |  |
| 5.2 | Fasten sheet metal together using appropriate methods consisting of the finger break, rolls, easy edger, drive turner and notching the sheet metal for the various joints. |  |
| 5.3 | Cut various lengths of “S” clips and build drives to connect the fittings together. |  |

## Benchmark 6: Codes

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 6.1 | Examine the Sheet Metal and Air Conditioning Contractors National Association (SMACNA) guidelines for sheet metal construction. |  |
| 6.2 | Examine the International Mechanical Code (IMC) for the standards used in the construction of sheet metal ductwork. |  |
| 6.3 | Examine the Air Conditioning Contractors of America (ACCA) Manual D to identify the concepts of airflow, static pressure, total pressure, total equivalent length (TEL) associated with each fitting used in the construction trade. |  |

I certify that the student has received training in the areas indicated.

Instructor Signature:

For more information, contact:

CTE Pathways Help Desk

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