

# HVAC INSTALLATION & RESIDENTIAL SERVICE (HEAT)

## **HEAT1110 | HVAC Ducts & Fittings | Lecture/Laboratory (2 Credits)**

Development and fabrication of ducts and fittings common to the heating, ventilation, and air conditioning industry, with emphasis on uniform and state code requirements. Methods of connecting ducts and fittings in an air system. Principles of geometric pattern development as it applies to duct construction and application. Multiple uses and care of hand tools common to the industry.

## **HEAT1120 | Transitional Fittings | Lecture/Laboratory (3 Credits)**

Focus on transitional fittings where the triangulation method of pattern development is required. Use of direct triangulation, as a short-cut method of layout, is emphasized. Identification, care, adjustment, and maintenance of floor equipment common to the sheet metal industry.

**Prerequisite(s):** HEAT1110

## **HEAT1130 | HVAC Trunk-line Construction | Lecture/Laboratory (2 Credits)**

Pattern development, and the fabrication of a scaled-down trunk-line, emphasizing the quality and quantity of work. Usage, construction methods, and installation of various types of dampers.

**Prerequisite(s):** HEAT1120

## **HEAT1140 | Fundamentals of Pattern Development | Lecture/Laboratory (3 Credits)**

Principles of pattern development as they apply to the layout of round fittings requiring parallel, or radial line methods of pattern development. Fabrication procedures for round fittings, including use of rotary machines for fabricating purposes, riveting, and spot welding. Use, safety, and proper procedures for soldering sheet metal are incorporated.

**Prerequisite(s):** HEAT1110, HEAT1120, And HEAT1130

## **HEAT1150 | Advanced Pattern Development | Lecture/Laboratory (3 Credits)**

Advanced theory and application of single, and double-line triangulation in the development of irregular patterns. Use of plan and elevation views in the visualization, and development of irregular objects as well as the procedure for the development of true-length lines seen in the foreshortened mode.

**Prerequisite(s):** HEAT1110, HEAT1120, HEAT1130, And HEAT1140

## **HEAT2210 | Welding Fundamentals | Lecture/Laboratory (3 Credits)**

Applications, safety, and procedures for oxyacetylene, stick, GMAW, and TIG welding. Light and heavy-metal welding in flat position, freehand-cutting procedures, types of weld joints, and joint preparation. Vulcan software for CNC plasma table controllers.

## **HEAT2220 | HVAC Design | Lecture/Laboratory (2 Credits)**

Heat loss and heat gain energy calculation based upon Manual J: Calculation. Development of the requirements for selecting and designing heating and cooling systems for residential construction. Operating characteristics, proper application, cost, advantages/disadvantages, and specific requirements for designing systems to meet specific needs.

## **HEAT2230 | Residential HVAC Installation | Lecture/Laboratory (6 Credits)**

Installation procedures of residential and small commercial heating, ventilation, and air conditioning systems. Emphasis on the Uniform Mechanical code, and Minnesota State Mechanical, Fuel Gas, and Plumbing code, pertaining to heating, ventilation, and air conditioning installation procedures. Air-handling ducts, venting, combustion and fresh-air ducts requirements. Use of available standard-type fittings; sizing, cutting, and threading of gas pipe as well as installation and code requirement of residential-style gas systems. Installation, setup, and maintenance, of industries most common indoor air quality accessories is included.

## **HEAT2240 | Commercial Blueprint Reading | Lecture/Laboratory (2 Credits)**

Architectural, structural, civil, electrical and mechanical blueprint reading with a major emphasis on heating, ventilation, and air conditioning systems contained within these plans. Duct construction, hangers and dampers evaluated according to specification and SMACNA requirements. Make drawings using AutoCAD: 2-D drafting commands for HVAC drafting.