

COURSE OUTLINE **Hydronic Piping**

Course Description

CLVG 116. Hydronic Piping. 3 hours credit. This course will enable the student to size hydronic piping networks and to understand the piping arrangements and components used in a hydronic system. The student will size the components based on a completed heat loss. The student will be required to calculate flow rates, pipe sizes, pressure drops, system curves, expansion tanks, mixing devices and various heat emitters.

Course Relevance

Hydronic heating is an ideal opportunity for companies that are looking to separate themselves from their competition by offering options to end users. This course is ideal for the student who recognizes the need to diversify by offering different heating systems to clients.

Required Materials

Hydronics Institute of the AHRI. (2000). *I=B=R Residential hydronic heating installation design guide*. Berkeley Heights, NJ: Hydronics Institute of the AHRI.

Viega North America. (2008). *Radiant workbook*. Nashua, NJ: Viega North America.

Learning Outcomes

The intention is for the student to be able to:

1. Understand hydronic heating components.
2. Understand hydronic heat emitters options.
3. Understand hydronic network options.
4. Design a hydronic network for a specific project.

Course Content

- I. Skills/Competencies – Actions that are essential to achieve the course outcomes:
 - A. Understand components of a hydronic heating system
 - B. Understand how to calculate the hydronic heat emitter's output
 - C. Understand how to size piping networks
 - D. Understand how to size system components

Learning Units

- I. Hydronic components
 - A. Circulators
 - B. Expansion tanks
 - C. Air control
 - D. Fill line
 - E. Control valves

F. Relief valve

II. Heat emitters

- A. Radiant systems
- B. Cast iron baseboard heaters
- C. Finned-tube baseboard
- D. Kickspace heater

III. Network options

- A. Series
- B. One pipe
- C. Two pipe system
- D. Primary / secondary

IV. System sizing

- A. Heat emitters
- B. Components
- C. Piping networks
- D. Mixing devices
- E. Circulators

Learning Activities

Learning activities will be assigned to assist the student to achieve the intended learning outcomes through lecture, self-assessments, instructor-led class discussion, group activities, case studies, skill practice, and other activities at the discretion of the instructor.

Grade Determination

The student will be graded on the completion of learning activities and assessment tasks. Grade determinants may include the following: daily work, student presentations, class participation, skills improvement plan, and other methods of evaluation employed at the discretion of the instructor.