

## Master Syllabus

### HVA 1301 - Air & Water Distribution Systems

**Division:** Science, Mathematics and Engineering

**Department:** HVAC-R Engineering Technology

**Credit Hour Total:** 3.0

**Lecture Hrs:** 2.0 **Lab Hrs:** 3.0

**Prerequisite(s):** MET 1131AND HVA 1201AND MAT 0200

**Date Revised:** January 2015

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#### Course Description:

Theory and practice of fluid flow in HVAC distribution systems, including water system design and analysis, duct design and analysis, fan and pump selection, valve and damper selection and Testing, Adjusting, and Balancing (TAB) procedures. Hand calculations and use of computer-based design and analysis tools; select hands-on laboratory studies reinforce basic principles; proper installation practices are also included. Two classroom, three lab hours per week.

#### General Education Outcomes:

- Critical Thinking/Problem Solving Competency
- Information Literacy Competency
- Computer Literacy Competency

#### Course Outcomes:

##### Distribution system/sizing

Demonstrate proficiency in selecting appropriate sizes for piping, ductwork and associated fittings to meet system design objectives.

**Assessment Method:** Locally developed exams

**Performance Criteria:**

70% or more correct on exams

**Assessment Method:** Simulations

**Performance Criteria:**

Earn at least 70% of available points on assignments.

##### Testing, adjusting, and balancing

Perform basic TAB procedures on both air and water systems including system documentation.

**Assessment Method:** Performance appraisals

**Performance Criteria:**

70% or better on laboratory exercises

##### Fluid flow losses

Demonstrate proficiency with calculation of losses in piping and ductwork systems.

**Assessment Method:** Locally developed exams

**Performance Criteria:**

70% or more correct on exams

**Assessment Method:** Simulations

**Performance Criteria:**

Earn at least 70% of available points on assignments

##### Fan and pump selection

Select appropriate fans and pumps matched to specific HVAC distribution systems.

**Assessment Method:** Locally developed exams

**Performance Criteria:**

70% or more correct on exams

**Assessment Method:** Simulations

**Performance Criteria:**

Earn at least 70% of available points on assignments.

##### Damper and control valve selection

Select and properly size dampers and control valves for application in HVAC systems.

**Assessment Method:** Locally developed exams

**Performance Criteria:**

70% or more correct on exams

#### Outline:

Principles of fluid flow, including analysis of open and closed loop systems  
Friction in piping and ductwork  
Pipe sizing and analysis (includes hand and computer-aided design and selection)  
Pump selection (includes hand and computer-aided selection)  
Valve selection  
Duct design and analysis (includes hand and computer- aided design and selection)  
Fan systems and fan selection (includes hand and computer-aided design and selection)  
Diffuser selection  
Damper selection  
Piping and ductwork installation standards  
Pump and fan system installation and operation