

## Master Syllabus

### HVA 1221 - Heating Systems

**Division:** Science, Mathematics and Engineering

**Department:** HVAC-R Engineering Technology

**Credit Hour Total:** 3.0

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

**Prerequisite(s):** DEV 0015

**Date Revised:** January 2015

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### Course Description:

Introduction to the basic concepts of all heating systems found in light commercial applications for the experienced and inexperienced in HVAC. A comprehensive presentation of HVAC systems, including rooftop packaged systems, heat pumps, packaged low-pressure boiler systems, and packaged unitary heaters. Includes low-pressure hot water and steam generation, including the fundamentals of heat generation in water-based heating systems. Two classroom, two lab hours per week.

### General Education Outcomes:

- Critical Thinking/Problem Solving Competency

### Course Outcomes:

#### Combustion process

Explain the combustion process.

**Assessment Method:** Locally developed exams  
**Performance Criteria:**

70% or better on exams

#### Water treatment

Describe the different types of water treatment and when and where they are used.

**Assessment Method:** Locally developed exams  
**Performance Criteria:**

70% or better on exams

#### Application of various fuel sources

Describe the proper application and safe use of various fuel sources.

**Assessment Method:** Locally developed exams  
**Performance Criteria:**

70% or better on exams

#### Fuel economizer

Describe the proper use of fuel economizers.

**Assessment Method:** Locally developed exams  
**Performance Criteria:**

70% or better on exams

#### Sequence of operation in basic systems

Describe the sequence of operation in basic systems.

**Assessment Method:** Locally developed exams  
**Performance Criteria:**

70% or better on exams

#### Types of boilers

Identify different types of boilers.

**Assessment Method:** Locally developed exams  
**Performance Criteria:**

70% or better on exams

#### Radiant heating

Explain the concept of radiant heating.

**Assessment Method:** Locally developed exams  
**Performance Criteria:**

70% or better on exams

### Outline:

Principles of heating energy conversion

Rooftop equipment

Types of fuels

Combustion processes

Water treatment

Safety controls and their operation

Fuel-saving equipment, ignition systems, component design and economizers

Specific applications in hot water systems including operation considerations

Preventive maintenance for light commercial systems