HVAC A106: NON-RESIDENTIAL APPLICATIONS FOR HVAC

Item	Value
Curriculum Committee Approval Date	12/02/2020
Top Code	094600 - Environmental Control Technology
Units	3 Total Units
Hours	81 Total Hours (Lecture Hours 45; Lab Hours 36)
Total Outside of Class Hours	0
Course Credit Status	Credit: Degree Applicable (D)
Material Fee	No
Basic Skills	Not Basic Skills (N)
Repeatable	No
Open Entry/Open Exit	No
Grading Policy	Standard Letter (S)

Course Description

Fundamentals of operation, maintenance, and trouble shooting of non-residential equipment and systems. Topics include but are not limited to chillers, centrifugal, reciprocal, absorption, and other current systems. PREREQUISITE: HVAC A100 and HVAC A101. Transfer Credit: CSU.

Course Level Student Learning Outcome(s)

1. Apply basic theory to the diagnosis, service, and repair of centrifugal, reciprocal, absorption and chiller systems.
2. Determine which system is best for a specific application; centrifugal or reciprocal.
3. Successfully centrifugal, reciprocal, absorption and chiller systems for employment with a passing grade.

Course Objectives

- 1. Describe the difference between a high and low pressure chiller system.
- 2. Describe how a basic chiller system functions.
- 3. Describe servicing, maintenance and repair fundamentals.
- 4. Identify maintenance schedules.
- 5. Describe which types of controls are appropriate for different types of systems.
- 6. Describe how a centrifugal compression system operates.
- 7. Describe the differences between centrifugal refrigeration and reciprocal refrigeration.
- 8. Describe which electrical start up procedures are best suited for various systems.
- 9. Explain the similarities and differences between basic maintenance procedures for reciprocal, centrifugal, and absorption systems.
- 10. Explain test procedures for industry based certification and licensing.

Lecture Content

Centrifugal Machine Components, Refrigeration cycle, Refrigeration Centrifugal Compressors Vane Motor Evaporator Economizer Pump out System Condenser Purge Maintenance Trouble Shooting Controls and Wiring Electric Motors Enclosures Starters Absorption - Terminology Basic Cycle Weak Solution Strong Solution Refrigeration Pumps Weak Strong Refrigerant Impellers Stator Rotor Wearing Open Seal Pumps Carrier York Trane Preventive Maintenance Weekly (purge system) Monthly Reclaim In operation Shut down Octyl Alcohol Machine Tightness (R.V.T.) Low Temperature Cut Out Evaporator Charge Capacity By Pass Cleaning Tubes Cooling Cleaning Water Treatment P.H. Control Crystallization Chillers - High and Low Pressure Chilled Water Systems Compressors Condensers Evaporators Refrigerant Control Devices Electric Control Devices Motors, Starters, Protectors Accessories System Design Applications Refrigerant Piping Capacity Control Electric Circuits Installation and Service Installation Servicing Fundamentals Maintenance

Lab Content

See Course Content.

Method(s) of Instruction

- Lecture (02)
- DE Live Online Lecture (02S)
- Lab (04)
- DE Live Online Lab (04S)

Instructional Techniques

Textbooks, videos, handout, guest speakers and some field trips.

Reading Assignments

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Writing Assignments

Homework, handouts and verbal questions. Due to size of the equipment no hands on can be used.

Out-of-class Assignments

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Demonstration of Critical Thinking

Testing using but not limited to, fill in, essay, true/false and multiple choice.

Required Writing, Problem Solving, Skills Demonstration

Homework, handouts and verbal questions. Due to size of the equipment no hands on can be used.

Eligible Disciplines

Air conditioning, refrigeration, heating (solar energy technician): Any bachelor's degree and two years of professional experience, or any associate degree and six years of professional experience. Air conditioning, refrigeration, heating (solar energy technician): Any bachelor's degree and two years of professional experience, or any associate degree and six years of professional experience.

Textbooks Resources

1. Required Whitman, Johnson, Tomczyk, Silberstein. Refrigeration and Air Conditioning Technology, 6th ed. Thompson/Delmar Learning, 0
Rationale: latest