Western Technical College

10601102 HVACR Air Handling, Psychrometrics & IAQ

Course Outcome Summary

Course Information

Description	Learners will size duct systems, select fans and use air balancing test instruments. The use of the psychometric chart to calculate heat and humidity transfer into or out of air will also be introduced. Learners will study the purpose and means of continuous indoor air quality. HVACR is a common reference to Heating, Ventilation, Air Conditioning and Refrigeration.
Career Cluster	Architecture and Construction
Instructional Level	Associate Degree Courses
Total Credits	1
Total Hours	27

Textbooks

Refrigeration and Air Conditioning Technology. 9th Edition. Copyright 2021. Whitman, Bill, Bill Johnson, John Timczyk, and Eugene Silberstein. Publisher: Cengage Learning. **ISBN-13**:978-0-357-12227-3. Required.

Trane Ductulator English and Si Metric Units. Publisher: Trane Company. Required.

Success Abilities

1. Cultivate Passion: Enhance Personal Connections
2. Cultivate Passion: Increase Self-Awareness
3. Refine Professionalism: Improve Critical Thinking

Program Outcomes

1. Troubleshoot HVACR systems
2. Evaluate HVACR system designs
3. Analyze HVACR systems

Course Competencies

1. Develop a philosophy that recognizes the need for continuous indoor air quality

Assessment Strategies

1.1. Written Objective Test

Criteria

You will know you are successful when

1.1. exam questions covering the elements of human comfort are answered with 80% accuracy
1.2. exam questions covering the sources of indoor air pollution are answered with 80% accuracy
1.3. exam questions covering the methods of controlling indoor air contamination are answered with 80% accuracy
1.4. exam questions covering the different types of air cleaners are answered with 80% accuracy

Learning Objectives

1.a. Explain the importance of the elements of human comfort
1.b. List the sources of indoor air pollution
1.c. Describe methods of controlling indoor air contamination
1.d. Differentiate between the different types of air cleaners

2. Summarize the principles of air flow in ducts

Assessment Strategies

2.1. Written Objective Test

Criteria

You will know you are successful when

2.1. exam questions covering the major code requirements for ventilation are answered with 80% accuracy
2.2. exam questions relating to the identification of fan types are answered with 80% accuracy
2.3. learner measures external static pressure using a hand-held pressure gauge

Learning Objectives

2.a. Understand the major code requirements of supplying air to an area to be environmentally controlled
2.b. Identify the various types of fan/blower systems used in the HVACR industry
2.c. Understand the purpose and means for filtering air
2.d. Relate fan external static pressure to air flow
2.e. Use hand held pressure gauges

3. Design a duct distribution system

Criteria

You will know you are successful when

3.1. task sheet determines the total equivalent length of duct with 80% correct responses
3.2. task sheet determines duct sizes using a friction loss chart with 80% correct responses
3.3. exam questions covering duct system components are answered with 80% accuracy
3.4. you determine duct sizes using a ductulator on a graded exercise with 80% correct responses
3.5. exam questions covering the identification of the segments of a duct layout where there is a potential for a change in duct size are answered with 80% accuracy

Learning Objectives

3.a. Calculate total equivalent length of duct runs
3.b. Determine duct sizes using friction loss charts
3.c. Identify components of air distribution systems
3.d. Determine duct sizes using a ductulator

3.e. Use an organized method of labeling segments of a duct system
3.f. Determine when the quantity of airflow changes in a duct system

4. Relate psychrometric fundamentals to HVAC applications

Criteria

You will know you are successful when

4.1. task sheet questions identifying components of the psychrometric chart are answered with 80% correct responses
4.2. you use a sling psychrometer to measure the conditions of air within + or - 1 degree as compared with the instructor's reading
4.3. you determine sensible and latent heat changes on a psychrometric chart with 80% correct responses
4.4. you use a psychrometric chart to determine when condensation will occur with 80% accuracy
4.5. you identify the mixed air conditions on a psychrometric chart with 80% correct answers

Learning Objectives

4.a. Define psychrometric terms
4.b. Explain the information found on the psychrometric chart
4.c. Measure the conditions of air
4.d. Apply the psychrometric chart to determine sensible and latent heat changes
4.e. Determine when condensation will occur
4.f. Apply the psychrometric chart to determine mixed air conditions