



Western Technical College

10601108 HVACR Residential Heating & Cooling Loads

Course Outcome Summary

Course Information

Description	This course covers human comfort and heat transfer. Learners will complete a heat loss and a heat gain calculation of a residence. 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.

Success Abilities

1. Live Responsibly: Develop Resilience
2. Live Responsibly: Foster Accountability

Program Outcomes

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

Course Competencies

1. Summarize the scope of air conditioning.

Assessment Strategies

- 1.1. Written Objective Test

Criteria

You will know you are successful when

- 1.1. you lists the environmental conditions that an air conditioning system may control.
- 1.2. you explain internal environmental conditions that provide adequate human comfort.
- 1.3. you sketch the arrangement of the main components of heating and cooling systems.
- 1.4. you summarize the HVAC industry and HVAC job responsibilities.

Learning Objectives

- 1.a. Examine the environmental conditions that are controlled by an air conditioning system.
- 1.b. Identify the indoor conditions that affect human comfort.
- 1.c. Identify the main components of heating and cooling systems.
- 1.d. Explore the HVAC industry and HVAC job responsibilities.

2. Apply the fundamentals of heat transfer.

Assessment Strategies

- 2.1. Written Objective Test

Criteria

You will know you are successful when

- 2.1. exam questions using the energy equation are answered with 80% accuracy
- 2.2. exam questions covering heat transfer fundamentals are answered with 80% accuracy
- 2.3. exam questions using the basic heat transfer formula are answered with 80% accuracy
- 2.4. exam questions covering heat transfer factors are answered with 80% accuracy

Learning Objectives

- 2.a. Define heat transfer terms
- 2.b. Explain heat transfer fundamentals
- 2.c. Determine heat transfer factors
- 2.d. Summarize the basic heat transfer formula
- 2.e. Apply the heat transfer formula

3. Calculate room and residential heat loss.

Assessment Strategies

- 3.1. Written Objective Test

Criteria

You will know you are successful when

- 3.1. you select appropriate design temperatures
- 3.2. you identify likely areas where heat heat loss will occur
- 3.3. you select appropriate heat transfer coefficients
- 3.4. you calculate heat transfer losses with 80% accuracy
- 3.5. you calculate the infiltration or ventilation loads with 80% accuracy
- 3.6. you determine the gross heating load with 80% accuracy

Learning Objectives

- 3.a. Select indoor and outdoor design temperatures
- 3.b. Determine areas where heat heat loss will occur
- 3.c. Determine heat transfer coefficients
- 3.d. Calculate the heat transfer losses
- 3.e. Determine infiltration or ventilation load
- 3.f. Determine gross heating load

4. Complete a residential cooling load analysis.

Assessment Strategies

4.1. Written Objective Test

Criteria

You will know you are successful when

- 4.1. you select the indoor and outdoor design temperatures with 80% accuracy
- 4.2. you determine areas where heat gain will occur with 80% accuracy
- 4.3. you determine heat transfer coefficients with 80% accuracy
- 4.4. you calculate the external heat gains with 80% accuracy
- 4.5. you calculate the internal heat gains with 80% accuracy
- 4.6. you calculate each room load with 80% accuracy
- 4.7. you calculate the building peak load with 80% accuracy

Learning Objectives

- 4.a. Select indoor and outdoor design temperatures

- 4.b. Determine areas where heat gain will occur

- 4.c. Determine heat transfer coefficients

- 4.d. Calculate the external heat gains

- 4.e. Calculate the internal heat gains

- 4.f. Calculate each room cooling load

- 4.g. Calculate the building peak cooling load
