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Western Technical College

10481105 Energy Modeling 1

Course Outcome Summary

Course Information

Description	This course will teach the student how to use "Manual J" from ACCA, REScheck, and REMrate. Students will develop the skills to do residential heating and cooling heat loads. Students will calculate heat loss and also losses or gains due to infiltration, sun loads and internal gains. Additionally, the students will begin to investigate energy consumption associated with lighting, appliances and plug loads.
Career Cluster	Architecture and Construction
Instructional Level	Associate Degree Courses
Total Credits	3
Total Hours	54

Textbooks

No textbook required.

Success Abilities

1.   Cultivate Passion: Expand a Growth-Mindset

2.   Live Responsibly: Embrace Sustainability

3.   Live Responsibly: Foster Accountability

4.   Refine Professionalism: Act Ethically

5.   Refine Professionalism: Improve Critical Thinking

6.   Refine Professionalism: Participate Collaboratively

7.   Refine Professionalism: Practice Effective Communication

Course Competencies

1.   Explore heating and cooling loads in buildings.

Assessment Strategies
1.1.   Project

1.2.   Presentation

Criteria

You will know you are successful when

1.1.   you calculate heating loads using software.
1.2.   you calculate cooling loads using software.
1.3.   you create a report documenting heating and cooling loads.
1.4.   you calculate heating and cooling loads of an existing building.
1.5.   you calculate heating and cooling loads from construction documents.
1.6.   you identify heating and cooling solutions.

Learning Objectives

1.a.   Examine sources of internal heat gains associated with buildings.
1.b.   Examine heat loss associated with buildings.
1.c.   Explore heating and cooling solutions for buildings.

2.   Examine appliance and plug loads associated with buildings.

Assessment Strategies
2.1.   Project
2.2.   Presentation

Criteria

You will know you are successful when

2.1.   you estimate energy consumption of appliances and plug loads.

2.2.   you examine appliance and plug load use patterns.
2.3.   you calculate the heat associated with appliances and plug loads.
2.4.   you compare the energy efficiency of appliances and plug loads.

Learning Objectives

2.a.   Explore appliances used in buildings.
2.b.   Identify plug loads in buildings.
2.c.   Compare energy efficiency of appliances.

3.   Examine envelope assemblies associated with buildings.

Assessment Strategies
3.1.   Project
3.2.   Presentation

Criteria

You will know you are successful when

3.1.   you identify building envelope components.
3.2.   you determine thermal resistance of building envelope components.

3.3.   you calculate heat flow through building envelope components.

Learning Objectives

3.a.   Explore thermal performance of foundation assemblies.
3.b.   Explore thermal performance of wall assemblies.
3.c.   Explore thermal performance of roof assemblies.

4.   Examine lighting loads associated with buildings.

Assessment Strategies
4.1.   Project
4.2.   Presentation

Criteria

You will know you are successful when

4.1.   you determine the number of lighting fixtures in a building.

4.2. you determine the wattage of lighting fixtures.
4.3. you estimate lighting usage patterns.

4.4. you calculate lighting loads.
4.5. you calculate internal heat gains associated with lighting.

Learning Objectives
4.a. Explore lighting solutions for buildings.
4.b. Analyze lighting usage patterns.
4.c. Examine costs associated with lighting loads.

5. Determine total energy consumption associated with buildings.

Assessment Strategies
5.1. Project
5.2. Presentation
5.3. Report

Criteria

Performance will meet expectations when

5.1. you document heating and cooling loads in a report.
5.2. you document lighting loads in a report.
5.3. you document appliance and plug loads in a report.
5.4. you determine energy costs associated with consumption.

Learning Objectives
5.a. Examine costs associated with energy
5.b. Compare energy consumption of similar buildings
5.c. Document energy consumption in a written report

6. Recommend energy conservation measures.

Assessment Strategies
6.1. Project
6.2. Presentation
6.3. Report

Criteria

You will know you are successful when

6.1. you estimate the cost of energy conservation measures.
6.2. you estimate the energy cost savings of energy conservation measures.
6.3. you calculate the cost effectiveness of energy conservation measures.
6.4. you calculate the cost of energy.
6.5. you calculate the life cycle costs of energy conservation measures.

Learning Objectives
6.a. Summarize potential energy conservation measures.
6.b. Examine cost effectiveness of energy conservation measures.
6.c. Document recommended energy conservation measures in a report.