



Western Technical College

10614300 Building Science

Course Outcome Summary

Course Information

Description	Students will study the concepts associate with building science principles including durability, structural integrity, thermal performance, moisture management, air tightness and on-site renewable energy systems.
Career Cluster	Architecture and Construction
Instructional Level	Technical Diploma Courses
Total Credits	1
Total Hours	36

Textbooks

No textbook required.

Course Competencies

1. Examine the properties of moisture.

Assessment Strategies

- 1.1. Simulation
- 1.2. Drawing/Illustration

Criteria

You will know you are successful when:

- 1.1. you analyze three different building assemblies using hygrothermal modeling software.
- 1.2. you determine vapor permeability of common building materials.
- 1.3. you understand moisture movements through building assemblies.
- 1.4. you identify effective drainage planes.

Learning Objectives

- 1.a. Describe moisture interactions with building materials.

- 1.b. Determine vapor permeability of building materials.
- 1.c. Predict moisture movements in building assemblies.

2. Examine the properties of energy.

Assessment Strategies

- 2.1. Simulation
- 2.2. Presentation

Criteria

You will know you are successful when:

- 2.1. you calculate the R-value of building assemblies.
- 2.2. you identify energy with infrared imaging.
- 2.3. you determine the embodied energy of building materials.

Learning Objectives

- 2.a. Describe energy interactions with building materials.
- 2.b. Explain how energy is transferred.
- 2.c. Understand the laws of thermodynamics.

3. Examine sustainable building principles.

Assessment Strategies

- 3.1. Case Study

Criteria

You will know you are successful when:

- 3.1. you determine energy consumption per square foot.
- 3.2. you calculate the embodied energy of building materials.
- 3.3. you identify on site renewable energy generation.
- 3.4. you identify sustainable building materials.
- 3.5. you identify sustainable building practices.
- 3.6. you verify a building meets code and industry standards.

Learning Objectives

- 3.a. Explore recycled, repurposed, and reused building materials.
- 3.b. Determine the embodied energy in building materials.
- 3.c. Choose sustainably sourced building materials.
- 3.d. Examine building codes and standards.

4. Explore foundation assemblies.

Assessment Strategies

- 4.1. Drawing/Illustration
- 4.2. Presentation
- 4.3. Case Study

Criteria

Performance will be satisfactory when:

- 4.1. You identify footings on construction documents
- 4.2. You identify below grade walls on construction documents
- 4.3. You determine the r-value of foundation assemblies
- 4.4. You determine moisture interactions with foundation assemblies

Learning Objectives

- 4.a. Examine footings
- 4.b. Identify below grade wall assemblies
- 4.c. Summarize moisture challenges in foundations
- 4.d. Summarize energy challenges in foundations

5. Explore wall assemblies.

Assessment Strategies

- 5.1. Drawing/Illustration
- 5.2. Case Study

Criteria

You will know you are successful when:

- 5.1. you identify wall framing components.
- 5.2. you identify structural insulated panels.
- 5.3. you identify air tight layers.
- 5.4. you identify thermal layers.
- 5.5. you calculate the R-value of wall assemblies.

Learning Objectives

- 5.a. Identify wall assemblies.
- 5.b. Examine wall, floor, and foundation connections.
- 5.c. Summarize moisture issues in above grade wall assemblies.
- 5.d. Summarize energy issues in above grade wall assemblies.

6. Explore roof assemblies.

Assessment Strategies

- 6.1. Case Study
- 6.2. Drawing/Illustration

Criteria

You will know you are successful when:

- 6.1. you identify roof coverings on construction documents.
- 6.2. you identify roof framing components on construction documents.
- 6.3. you identify air tight layers on construction documents.
- 6.4. you identify moisture control layers on construction documents.
- 6.5. you calculate the R-value of roof assemblies.
- 6.6. you identify liquid water management layers on construction documents.

Learning Objectives

- 6.a. Identify roof assemblies.
- 6.b. Examine roof-wall connections.
- 6.c. Summarize moisture issues in roof assemblies.
- 6.d. Summarize energy issues in roof assemblies.