

# Envelope Fundamentals



16 to 18 hours to complete.

7 quizzes plus practice exercises

Final test 100 questions

Passing mark on final test = 70%

## COURSE DESCRIPTION

Effective upgrades to building envelopes that create comfortable and durable homes are based on a solid understanding of building science and the house as a system. Envelope Fundamentals is made up of 7 modules that cover the following topics:

1. House as a System
2. Indoor Air Quality
3. Healthy Housing
4. Ventilation
5. Fundamentals of Air Sealing
6. Strategies for Air Sealing
7. Fundamentals of Insulation

Each module includes a downloadable study guide to accompany the online learning program. There is a review and quiz at the end of each module to help you gauge your understanding of the topics covered.

## Objectives

After completing this course, you will be able to:

- Apply the House as a System Concept
- Describe how building science affects building durability and occupant comfort
- Categorize the signs, symptoms and solutions for good indoor air quality
- Identify how various elements of a building control or contribute to heat, air, and moisture flows
- Discuss the importance of air sealing and insulation to the performance of the building

# Envelope Fundamentals



## COURSE OUTLINE

### Introduction

House as a System

Healthy Indoor Environment

- Indoor Air Quality
- Healthy Housing
- Ventilation

Building Envelope

- Fundamentals of Air Sealing
- Strategies for Air Sealing

### Module 1: House As A System

Heat Flow

- Convection
- Conduction
- Radiation

Air Flow

- Wind Effect
- Stack Effect
- Combustion/  
Ventilation Effect
- Neutral Pressure Plane

Moisture Flow

- Humidity
- Liquid Water
- Water Vapor

### Module 2: Indoor Air Quality

Sources

- Airborne
- Moisture-Related

Symptoms

- Occupant
- House Structure

Solutions

- Eliminate
- Filtrate
- Ventilate

### Module 3: Healthy Housing

Materials

- Construction Assembly
- Finishes

Combustion Spillage

- Signs
- Risks
- Remediation

Radon

- Identifying
- Testing
- Controlling

### Module 4: Ventilation Requirements

Why Ventilate?

- Controlling Air Flow
- Air Filtration
- Occupant Impacts

Ventilation Standards

- Overview
- Requirements
- Calculation Methods

Systems

- Exhaust Only
- Supply Only
- Balanced Whole House

# Envelope Fundamentals



## COURSE OUTLINE

### **Module 5: Fundamentals of Air Sealing**

Purpose of Air Sealing

Types of Barriers

- Weather Barriers
- Air Barriers
- Vapor Barriers

Approaches

- Interior Air Barriers
- Exterior Air Barriers

Air Sealing Materials

### **Module 6: Strategies for Air Sealing**

Air Sealing Issues

- Thermal Bypasses
- Solar Vapor Drive
- Ice Damming

Foundations

Walls & Floors

Ceilings & Roofs

### **Module 7: Fundamentals of Insulation**

Properties of Insulation

- Dew Point
- Wind Washing

R-value

- Nominal R-Value
- Effective R-value

Insulation Materials

- Fibrous Types
- Foam Types