

Envelope Fundamentals



3 hours narrated instruction, 12 to 18 hours to complete with review of content, quizzes, final test and review of downloadable materials.

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

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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

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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