

Building Science for Insulators (USA)



4 hours narrated instruction, 16 to 20 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

Explore building science and its importance to installing insulation for effective building envelopes and durable homes. Building Science for Insulators is made up of 10 modules that cover the following topics:

1. Introduction to Construction Technology
2. Building Components
3. Moisture Management
4. House as a System
5. Indoor Air Quality
6. Fundamentals of Air Sealing
7. Strategies for Air Sealing
8. Fundamentals of Insulation
9. Strategies for Insulation
10. Ventilation Requirements

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
- Interpret the role of sustainable development in construction
- Understand how building science affects building durability and occupant comfort
- Categorize the signs, symptoms and solutions for good indoor air quality
- Describe building envelope details
- Identify how the control or contribute to heat, air, and moisture flows
- Explain the importance of mechanical ventilation

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COURSE OUTLINE

Module 1: What is Construction Technology?

Construction Technology

Introduction

Building Science

House As A System

Sustainability

Energy Efficiency
Resource Efficiency
Environmental Responsibility

Module 2: Building Components & Systems

Foundations

Basement Types
Crawlspace
Slab On Grade

Walls & Floors

Framed Walls
Masonry Walls
Floor Systems
Panelized Systems
Roof System Types

Module 3: Moisture Management

Keeping Moisture Off, Out, and Away

Foundations
Walls
Roofs

Module 4: 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 5: Indoor Air Quality

Sources

Airborne
Moisture-Related

Symptoms

Occupant
House Structure

Solutions

Eliminate
Filtrate
Ventilate

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COURSE OUTLINE

Module 6: 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 7: Strategies for Air Sealing

Air Sealing Issues

- Thermal Bypasses
- Solar Vapour Drive
- Ice Damming

Foundations
Walls & Floors
Ceilings & Roofs

Module 8: Fundamentals of Insulation

Properties of Insulation

- Dew Point
- Wind Washing

R-value

- Nominal R-Value
- Effective R-value

Insulation Materials

- Fibrous Types
- Foam Types

Module 9: Strategies for Insulating

Below Grade

- Slabs
- Walls

Above Grade

- Rim Joists
- Walls
- Exposed Floors

Ceilings

- Flat Ceilings
- Sloped Ceilings

Module 10: Ventilation Requirements

Why Ventilate?

- Controlling Air Flow
- Air Filtration
- Occupant Impacts

ASHRAE 62.2 Standard

- Calculation Methods
- Indoor Air Quality

Systems

- Exhaust Only
- Supply Only
- Balanced Whole House