

Construction Technology (Canada)



5 hours narrated instruction, 18 to 22 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 constructing effective building envelopes and building durable homes. Construction Technology is made up of 14 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. Healthy Housing
7. Fundamentals of Air Sealing
8. Strategies for Air Sealing
9. Fundamentals of Insulation
10. Strategies for Insulation
11. Fundamentals of Windows and Doors
12. Fundamentals of Energy
13. Mechanical Systems Overview
14. 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
- Distinguish between mechanical systems

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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 Vapour

Module 5: Indoor Air Quality

Sources

Airborne
Moisture-Related

Symptoms

Occupant
House Structure

Solutions

Eliminate
Filtrate
Ventilate

Module 6: Healthy Housing

Materials

Construction Assembly
Finishes

Combustion Spillage

Signs
Risks
Remediation

Radon

Identifying
Testing
Controlling

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COURSE OUTLINE

Module 7: Fundamentals of Air Sealing

Purpose of Air Sealing

Types of Barriers

Weather Barriers
Air Barriers
Vapour Barriers

Approaches

Interior Air Barriers
Exterior Air Barriers

Air Sealing Materials

Module 8: Strategies for Air Sealing

Air Sealing Issues

Thermal Bypasses
Solar Vapour Drive
Ice Damming

Foundations
Walls & Floors
Ceilings & Roofs

Module 9: 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 10: Strategies for Insulating

Below Grade

Slabs
Walls

Above Grade

Rim Joists
Walls
Exposed Floors

Ceilings

Flat Ceilings
Sloped Ceilings

Module 11: Fundamentals of Windows & Doors

Window & Door Anatomy

Comfort Factors

Radiation
Solar Gain
Convection
Wind Washing
Conduction

Window Performance

Solar Heat Gain Coefficient
Visible Transmittance
U-Values
Glazing
Emissivity
Gas fills
Insulating Spacers
Frames

Doors

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COURSE OUTLINE

Module 12: Fundamentals of Energy

Occupant Comfort

- Degree Days
- Mechanical Systems
- F-280 Standard

Fuel & Energy Sources

- Energy Terms
- Combustion Fuels
- Electricity

Heat Loss/Heat Gain

- F-280 Requirements
- Winter Design Conditions
- Heat Loss Calculation
- Sensible & Latent Heat Gain
- Summer Design Conditions

Module 13: Mechanical Systems Overview

Space Heating

- Furnaces
- Boilers
- Electric Resistance
- Heat Pumps
- Integrated Mechanical
Systems
- Efficiency & Performance

Space Cooling

- Types of Air Conditioners
- Efficiency and Performance

Delivery Systems

- Forced Air
- Hydronic
- Controls

Module 14: Ventilation Requirements

Why Ventilate?

- Controlling Air Flow
- Air Filtration
- Occupant Impacts

F-326 Standard

- Room Count
- Ventilation Capacity
- Depressurization

Systems

- Exhaust Only
- Supply Only
- Balanced Whole House