OREGON

Energy Efficient Building

Series B Course Syllabus

Course ID# SRB003

Course Description

This five hour online video course will bring attention to methods of green building that allow homes to have less impact on the environment, while providing a greater economic benefit to the homeowner. Even as technological innovation creates new construction possibilities, incorporating energy-efficiency into building projects can not only provide a better quality of life, but also protect the environment. A comprehensive approach to resource and energy efficiency is the best method to achieve a resource and energy efficient building. This course will help builders identify important considerations and then apply those principles to a specific project.

This online course is presented in a video format. Students should review the videos, and then answer the chapter quizzes. Learning objectives directly relate to integrated quizzes. Students must answer 70% of the questions correctly in order to move from lesson to lesson, and to receive credit/certification for the course.

COURSE OUTLINE

Chapter 1. Heat Transfer and Thermal Imaging

(Video length 17 minutes)

Learning Objectives: 1) Recognize the impact of energy consumption. 2) Understand energy conservation and generation concepts. 3) Identify types of heat transfer. 4) Describe the uses of thermal imaging cameras and blower door equipment.

I. Energy Consumption

A. Energy
B. Resources
C. Building Systems

II. Energy Conservation

A. Reduced consumption, emissions
B. Energy Efficiency Standards and Methods

III. Diagnostic Testing

A. Thermal Imaging
B. Blower Door Testing

Chapter 2. Advanced Framing Techniques

(Video length 17 minutes)

Learning Objectives: 1) What is advanced framing, and what are some of the techniques used? 2) List the uses of insulated headers and energy heel trusses. 3) Understand the benefits of pre-fabricated walls.

I. Advanced Framing Techniques

A. 2 x 6 studs
B. Headers
C. Raised Heel Trusses

II. Raised Heel Trusses

A. Full height insulation
B. Cost efficient

III. Double 2 x 4 Walls

A. Thicker insulation
B. Drawbacks

IV. Prefabricated Walls

A. Reduced waste
B. Higher quality

Chapter 3. Air Barriers

(Video length 19 minutes)

Learning Objectives: 1) Apply the benefits of energy efficient building. 2) Describe the purpose of air barriers and what materials are typically used. 3) List the uses of SIPs and ICFs.

I. Design and Implementation of Energy Efficient Design

A. Design phase
B. Subs and employees
C. Training

II. Air Sealing

A. Finding leaks
B. Materials

III. Airtight Drywall

A. Methods
B. Drawbacks

IV. Prefabricated Walls

A. Reduced waste
B. Higher quality

C. SIPs
D. ICFs

Chapter 4. Insulation

(Video length 18 minutes)

Learning Objectives: 1) Recognize the pros and cons of fiberglass and cellulose insulation material. 2) Describe the proper installation of fiberglass insulation. 3) Apply proper installation of cellulose insulation.

I. Fiberglass Batts

A. Uses
B. Various configurations: high density, standard density
C. Installation

II. Cellulose Insulation

A. Uses
B. Various configurations: dense packed, dry spray

III. Roof Installation

A. Methods
B. Baffles

Chapter 5. Foam Insulation/Sheathing

(Video length 22 minutes)

Learning Objectives: 1) Identify different types of foam insulation available. 2) Understand the pros and cons of polyisocyanurate and polyurethane spray foam. 3) Demonstrate the many uses of both EPS and XPS insulating sheathing.

I. Spray Foam

A. Urea Formaldehyde
B. Cementitious
C. Phenolic
D. Polyisocyanurate or polyiso
E. Polyurethane

II. Various configurations

A. Open cell, Closed cell

III. Insulating Sheathing

A. Uses
B. Examples: expanded, extruded

Chapter 6. U-Factor/R-Value

(Video length 21 minutes)

Learning Objectives: 1) Recognize the uses of and effectiveness of radiant barriers. 2) Identify and define what the National Fenestration Rating Council does. 3) Formulate U-Factor and R-Value conversions. 4) Explore different methods to increase U-Factor.

I. Radiant Barrier Sheathing

A. Benefits
B. Heat Transfer
C. Types

II. Window selection

A. NFRC
B. SHGC
C. Low E coatings
D. Inert gas
E. Visible Transmittance
F. Air Infiltration Rate

III. U-Factor/R-Value

A. Definitions/Conversions

Chapter 7. Lighting/Duct Design

(Video length 19 minutes)

Learning Objectives: 1) What are the positives and negatives of incandescent or compact fluorescent lighting? 2) Understand the amount of energy wasted by poor duct design 3) Determine proper duct design and installation.

I. Incandescent Lighting

A. Benefits/Flaws

II. Compact Fluorescent Lighting

A. Benefits/Flaws

III. Light Emitting Diodes

A. Benefits/Flaws

IV. Duct Design

A. Best Practices
B. Duct Sealing
C. Installation
D. Common Problems

Chapter 8. Green Appliances

(Video length 25 minutes)

Learning Objectives: 1) Understand how to read energy guide labels. 2) Define heat/energy recovery ventilation. 3) Identify sealed combustion appliances. 4) List different types of water heaters. 5) Define and be able to understand what a SEER rating is.

I. Energy Guide Labels

A. What does it all mean?

II. Energy Recovery Ventilation

A. Benefits/Costs

III. Sealed Combustion Heating Appliances

A. Description
B. Benefits

IV. Water Heaters

A. Standard tank
B. Condensing
C. Tankless
D. Common Problems

V. Seasonal Energy Efficiency Ratio (SEER)

Chapter 9. Geothermal/Solar

(Video length 23 minutes)

Learning Objectives: 1) Recognize the features and benefits of a geothermal system. 2) Identify different types of geothermal designs. 3) Examine what a solar thermal water heating system is and how it works.

I. Geothermal Heating and Cooling

A. How does it work?
B. Return on investment

II. System Types

A. Water loop
B. Direct exchange
C. Heat pumps

III. Solar Thermal Water Heating

A. Description
B. Benefits
C. Types

- The Builders License Training Institute is responsible for the content of this course.
- This course is approved for five credit hours in ***CCB Residential Continuing Education: Series B***
- To have access to our online courses students must have access to a high-speed internet connection.
- Course instructors will be available by email or telephone between 9am and 5pm Eastern Standard Time. They will assist you with questions regarding course content.
- If you have any questions, please call us at **1-800-727-7104** or send an email to info@licensetobuild.com. Email responses will usually be returned promptly, but guaranteed within one business day.
- Students have six months to complete this course.
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