### Block 1 - Basic Tools

**Unit 1: How to Read a Plan**
- Lesson 1: Views
  - Elevation
  - Floor Plan
  - Plot Plan
  - Section
  - Detail
- Lesson 2: Basic Symbols
  - Walls
  - Windows
  - Door
  - Water Closet
  - Tub
  - Shower
  - Outlet
  - Switch
  - Light Fixture
  - Cabinetry
  - Shortened Line
  - Section View

**Lesson 3: Dimensions**
- Architect's Scale
- Engineer's Scale

**Unit 2: Measurement Basics**
- Lesson 1: Basic Tools
  - Measuring Tape
- Lesson 2: Mathematical Conventions
  - Order of Operations
  - Rounding Decimals
  - Converting Inches to Decimalized Feet

**Unit 3: Basic Construction Math**
- Lesson 1: One-dimensional Calculations
  - Each
  - Linear Feet
- Lesson 2: Basic 2-dimensional Calculations
  - Area of a Rectangle in Square Feet
  - Square Feet to Square Yard Conversions
- Lesson 3: Other 2-dimensional Calculations
  - Parallelogram
  - Trapezoid
  - Triangle
  - Circle
- Lesson 4: Three-dimensional Calculations
  - Cubic Yards
  - Board Feet

**Unit 4: Other Important Calculations**
- Lesson 1: Pythagorean Theorem
  - Using the Pythagorean Theorem
- Lesson 2: Other Construction Calculations
  - Calculating Squares
  - Calculating Waste
  - Rounding Quantities

### Block 2 - How Parts Fit

**Unit 1: Structure Components And Functions**
- Lesson 1: Basic Structure Parts
  - Soil
  - Footing
  - Foundation
  - Floor System
  - Walls (Bearing and Non-Bearing)
  - Roof
  - Structural Parts
  - Non-Structural Parts

**Lesson 2: Full Basement Home**
- Lesson 1: Soil Considerations
  - Load Bearing Capacity
  - Footing Minimum Depth
  - Footing Maximum Depth
  - Excavation
- Lesson 2: Reinforced Concrete
  - Making Concrete
  - Concrete Plasticity
  - Hydration
  - Admixtures
  - Rebar
- Lesson 3: Concrete Footings
  - Footing and Rebar Location
  - Pouring Footings
  - Finishing Footings
- Lesson 4: Concrete Foundations
  - Forms and Rebar Placement
  - Pouring Foundations
  - Anchor Bolts and Holdowns
- Lesson 5: Basement Floor Slab
  - Work Under the Slab
  - Shovel Footings
  - Pouring and Finishing the Slab
  - Potential Problems
- Lesson 6: Controlling Ground Water
  - Damproofing
  - Perimeter Drain
  - Backfill and Grading
- Lesson 7: Drying-In the Structure
  - Main Floor System
  - Walls
  - Roof
- Lesson 8: Completing the Structure
  - Rough-in Work
  - Interior Finish Work
  - Completing the Exterior

**Unit 2: Basic Framing Terms**
- Lesson 1: Lumber Terminology
  - Rough Cut
  - Surfacing
  - Drying
  - Grain
  - Moisture/Insect Resistance
- Lesson 2: Framed Wall Parts Terminology
  - Studs & Plates
  - Wall Ties
  - Door/Window Framing
- Lesson 3: Framing to Foundation Connection
  - Foundation Sill Plate
  - Sill Plate Attachment
- Lesson 4: Framed Wall Construction
  - Plate Placement
  - Stud Length
  - Crowning
  - Wall Placement
  - Top Plates
- Lesson 5: Main Floor Support System
  - Joist Placement
  - Band Joist
  - Horizontal Joist Support
  - Vertical Joist Support
- Lesson 6: Main Floor System Connectors
  - Headers and Joists for Stairs
  - Shearing
  - Nails
  - Metal Hangers
- Lesson 7: Beam Terminology
  - Use of Beams
  - Glue-Lam Beams
  - Dimensional Wood Beams
  - L-V-L Beams
  - Box Beam
  - Steel Beam

### Block 3 - Idea Through Wall Framing

**Unit 1: Getting Started**
- Lesson 1: Roles of Professionals
  - Architect
  - Engineer
  - Designer
  - Drafter
  - Developer
  - Contractors
  - Building Inspectors
- Lesson 2: Steps Before Construction Begins
  - Selecting Plans
  - Obtaining a Permit
  - Inspection Overview
- Lesson 3: Preparing the Hole
  - Hole Location
  - Hole Depth
  - Excavation

**Lesson 2: Framed Wall Parts Terminology**
- Studs & Plates
- Wall Ties
- Door/Window Framing

**Lesson 3: Framing to Foundation Connection**
- Foundation Sill Plate
- Sill Plate Attachment

**Lesson 4: Framed Wall Construction**
- Plate Placement
- Stud Length
- Crowning
- Wall Placement
- Top Plates

**Lesson 5: Main Floor Support System**
- Joist Placement
- Band Joist
- Horizontal Joist Support
- Vertical Joist Support

**Lesson 6: Main Floor System Connectors**
- Headers and Joists for Stairs
- Shearing
- Nails
- Metal Hangers

**Lesson 7: Beam Terminology**
- Use of Beams
- Glue-Lam Beams
- Dimensional Wood Beams
- L-V-L Beams
- Box Beam
- Steel Beam
### Lesson 8: Beam Support
- Metal Columns
- Wood Columns
- Floor Support

### Lesson 9: Sheathing Terminology
- Sheathing
- Sheathing Materials
- Exposure to Moisture

### Lesson 10: Sheathing Installation
- Floor Sheathing
- Fasteners and Glue
- Bending
- Alignment on Joists

### Lesson 11: Floor Joist Options
- I Joists
- Floor Trusses

### Lesson 12: Stair System Basics
- Stringers, Risers and Treads
- Landing and Top Riser
- Stair Assembly

### Lesson 13: Main Floor Walls
- Window/Door Location
- Stud Location
- Squaring the Wall
- Wall Sheathing
- Wall Bracing before Lifting
- Placing the Walls

### Lesson 14: Other Wall Framing Considerations
- Metal Studs
- Metal/Wood Comparison
- Framed to Square

### Block 4 - Roof Framing

#### Unit 1: Roof Types and Parts
- Lesson 1: Roof Styles
  - Gable Roof
  - Hip Roof
  - Gambrel Roof
  - Clerestory Roof
  - Shed Roof
  - Flat Roof
  - Mansard Roof
  - Butterfly Roof

- Lesson 2: Roof Parts
  - Peak, Rake, Eave, and Overhang
  - Deck, Intersections, and Dormer
  - Chimney Cricket

- Lesson 3: Roof Framing Parts
  - Ridge Board
  - Hip and Valley Rafters
  - Common Rafter
  - Jack Rafter
  - Cripple Rafter
  - Fascia and Soffit
  - Collar Tie
  - Bird's Mouth and Rafter Tail

#### Unit 2: Roof Rafter Support System
- Lesson 1: Making the Common Rafter
  - Rise/Run/Span
  - Slope/Pitch
  - Cutting Common Rafters

- Lesson 2: Rafter Support and Reinforcement
  - Stabilizing Rafters
  - Rafter Size
  - Mid-Rafter Support

- Lesson 3: Making Hips and Valleys
  - Rafter Placement
  - Hip Rafter Length
  - Jack and Valley Rafters

#### Unit 3: Post and Beam Roof Support System
- Lesson 1: Post and Beam System
  - Examples
  - Purlins
  - Metal Buildings

#### Unit 4: Roof Truss Support System
- Lesson 1: Facts About Trusses
  - Basic Parts of Trusses
  - Loads
  - Truss Centers and Span
  - Slope and Type of Truss

- Lesson 2: Truss Types
  - Flat Truss
  - Gable Truss
  - Gambrel Truss
  - Scissor Truss
  - Mono Truss
  - Bowstring Truss

- Lesson 3: Truss Dynamics
  - Forces
  - Gussets
  - Causes of Failure
  - Gusset Size at Critical Points
  - Gusset Placement

- Lesson 4: Installing Gable Trusses
  - Gable End Trusses
  - Placing Trusses
  - Cat Walk

#### Unit 5: Building the Roof on the Support System
- Lesson 1: Installing Rough Fascia and Fly Rafters
  - Rough Fascia & Fly Rafter Examples
  - Installing the Rough Fascia
  - Installing the Fly Rafter
  - Combines Truss and Rafter Roof Systems

- Lesson 2: Roof System Ventilation
  - Blocking/Insulation Stop
  - Need for Ventilation
  - Improperly Ventilated Roof

- Lesson 3: Positioning Trusses for Sheathing
  - Truss Layout Position
  - Truss Movement
  - Truss Bracing

- Lesson 4: Installing the Sheathing
  - Spaced Sheathing
  - Purlins
  - Sheathing Placement
  - Nailing of Sheathing

#### Lesson 5: Backing
- Backing Examples
- Ceiling Joist or Rafter as Backing
- Truss System as Backing

#### Lesson 6: Fire Blocking
- Walls
- Floor Systems
- Basement Framed Walls
- Stairways
- Dropped Ceilings

### Block 5 - Exterior Finishes

#### Unit 1: Concrete Work
- Lesson 1: Supporting Exterior Concrete
  - Fracturing Due to Settling
  - Haunch
  - Tube Formed Columns
  - Footing and Foundation Walls

- Lesson 2: Strengthening Exterior Concrete
  - Concrete Strength
  - Wire Reinforcement
  - Synthetic Fibers
  - Concrete Surface Strength

- Lesson 3: Common Flatwork and Related Finishes
  - Broom Finish
  - Trowl Pattern Finishes
  - Exposed Aggregate
  - Epoxy Finish
  - Concrete Stamp
  - Pavers

#### Unit 2: Decks
- Lesson 1: Exterior Decks
  - Deck Support
  - Deck Materials

#### Unit 3: Windows and Overhead Doors
- Lesson 1: Window Parts
  - Sizes
  - Placing the Window
  - Flashing
  - Jambs and Sill
  - Stop
  - Stool and Apron
  - Pane, Sash, and Lights
  - Muntin, Grid, and Mullion

- Lesson 2: Window Materials
  - Thermal Break
  - Frame Materials
  - Glass Types
  - Tinting and Low E

- Lesson 3: Types of Windows
  - Windows that Slide Open
  - Other Windows that Open
  - Fixed Windows
  - Bay and Bow Windows
  - Storm Windows

- Lesson 4: Overhead Garage Doors
  - Single Piece and Sectional Doors
  - Materials and Patterns
  - Door Features
Unit 4: Masonry and Stucco
Lesson 1: Brick Patterns and Bonds
- Vapor Barrier
- Brick Bonds
- Brick Courses
- Mortar Joints

Lesson 2: Structural Masonry
- Exteriors
- Block Types
- Wythe
- Fired and Unfired Brick

Lesson 3: Nonstructural Brick Veneer
- Story Pole
- Anchoring
- Lintels
- Quoins

Lesson 4: Stone Veneers
- Cultured Stone
- Installing Natural
- Mortar and Grout
- Cleaning Veneer

Lesson 5: Stucco
- Installing Common Stucco
- Three Stucco Layers
- Synthetic Stucco
- Installing Synthetic Stucco

Unit 5: Siding
Lesson 1: Common Siding Materials and Joints
- Siding
- Butt Joint
- Overlap Joint
- Tongue and Groove Joint
- Rabbet Joint
- Corner Joints
- Miter Joint

Lesson 2: Sheet Siding
- Fastening Sheet Siding
- Horizontal Butt Joint
- Unfinned Windows
- Sheet Siding Textures

Lesson 3: Horizontal Siding
- Lap Siding
- Fastening and Joints
- Rabeted Taper Siding
- Shiplap Siding

Lesson 4: Vertical Siding
- Board and Batten
- Board on Board
- Fastening Vertical Siding

Lesson 5: Interlocking Siding
- Metal and Vinyl Siding
- Expansion and Contraction
- Metal Channel

Unit 6: Soffit, Fascia, and Gutters
Lesson 1: Soffit and Fascia
- Metal Installation
- Wood Installation
- Frieze Board
- Cornice

Lesson 2: Gutters and Downspouts
- Materials Used
- Installation
- Aluminum Gutters

Unit 7: Fences
Lesson 1: Fencing
- Masonry
- Vinyl
- Chain Link
- Wrought Iron
- Wood
- Gates

Unit 8: Paint
Lesson 1: Exterior Painting
- Surface Preparation
- Primer Coat
- Brushes and Rollers
- Sprayers
- Masking and Painting Techniques

Block 6 – Roofing

Unit 1: Common Roofing Materials
Lesson 1: Asphalt Based Roofing Materials
- Shingles and Membranes
- Asphalt Saturated Products
- Fiberglass vs. Organic Mat
- Composition Shingles

Lesson 2: Composition Shingle Production
- Surface Granules
- Release Film/Sealant Strip
- Splices in Production

Lesson 3: Flat Roof Systems
Lesson 1: Membrane Roof System
- Roof Flashing
- Flat Roof Slope
- Roof Drain
- Parapet Wall Joint
- Scupper Roof Drains

Lesson 2: Multi-ply Membrane Roof System
- Built-up Roof
- Built-up Roof Plies

Lesson 3: Multi-ply Membrane Roof
- Installation
- Base Sheet
- Hot Tar
- Surface Finishes
- Determining Plies
- Common Problems

Lesson 4: Single Membrane Roof Systems
- Joining Different Materials
- Modified Bitumen Roof System
- Modified Bitumen Installation
- Surface Finish

Lesson 5: Elastomeric Roof System
- Materials
- Installation
- Roof Deck Preparation
- Seams
- Problems and Maintenance

Unit 3: Sloped Roof Characteristics
Lesson 1: Roof Shingles
- How They Work
- Roofing Felt
- Rubberized Asphalt Membrane
- Problems

Lesson 2: Roof Flashing
- Purpose
- Step and L Flashing
- Counter flashing
- Valley and Pipe Flashing
- Drip Edge

Lesson 3: Sloped Roof Considerations
- Steepness
- Height
- Accessibility

Unit 4: Composition Shingles
Lesson 1: Identification
- Organic vs. Fiber Glass
- Tabs
- Laminated
- Interlocking

Lesson 2: Cost Factors
- Style
- Warranty
- Labor

Lesson 3: Non-interlocking Installation
- Courses
- Attachment
- Valley Flashing

Lesson 4: Interlocking Installation
- Courses
- Attachment
- Valley Flashing

Unit 5: Wood Roofs
Lesson 1: Shake and Wood Shingle
- Identification
- Wood Shake Production
- Types
- Thickness
- Wood Shingle Production
- Recognizing Grades
- Grade Categories

Lesson 2: Prep for Installation
- Exposure and Quantities
- Patterns and Cost
- Decking

Lesson 3: Installation
- Courses
- Shake Felt
- Valleys

Unit 6: Tile Roofs
Lesson 1: Tile Shingle Production
- Shape
- Clay Tile
- Concrete Tile

Lesson 2: Tile Shingle Cost Factors
- Material
- Color
- Shipping
- Roof Complexity and Access
## ILX Construction Training Course Overview

**Block 7 - Finishing the Interior**

### Unit 1: Electrical

**Lesson 1: Electricity to the Home**
- Generation of Electricity
- Distribution to the Home

**Lesson 2: Wiring Concepts and Terms**
- Breaker Panel/Fuse Box
- Grounding
- 120 Volt and 240 Volt
- Wire Gauge
- Knob and Tube Wiring
- Conduit

**Lesson 3: House Wiring**
- Electrical Circuits
- Rough Electrical
- Finish Electrical
- Wire Connections
- Low Voltage Wiring

### Unit 2: Plumbing

**Lesson 1: Culinary Water Supplies**

### Unit 3: HVAC

**Lesson 1: Basic Heating Concepts**
- The Thermostat
- Heat Systems
- Forced Air Systems
- Forced Air Furnaces

**Lesson 2: How Heat is Created & Transferred**
- Producing Heat & Venting Gases
- Heat Exchangers
- "Pulse" Furnaces
- Combustion Air for Furnaces

**Lesson 3: Central Air Conditioning and Heat Pumps**
- Air Conditioning
- Heat Pumps

**Lesson 4: Miscellaneous HVAC**
- Evaporative Coolers
- Humidifiers
- Electrostatic Filters
- Kitchen and Bath Ventilation

**Lesson 5: Masonry Fireplaces**
- Installing a Masonry Fireplace
- The Hearth, Firebox and Mantel
- Inside the Masonry Fireplaces

### Unit 4: Painting and Wallpaper

**Lesson 1: Interior Painting**
- Paint Sheen or Gloss
- Preparation for Paint
- The Primer Coat
- The Finish Coat

### Unit 7: Metal Roofs

**Lesson 1: Metal Roof Products**
- Materials
- Finishes

**Lesson 2: Metal Roof Installation**
- Panels
- Seams
- Self Tapping Screws
- Corrugated Panels
- Standing Seam
- Metal Gauge

### Unit 8: Other Shingle Types

**Lesson 1: Slate Shingles**
- Grain
- Color
- Cuts

**Lesson 2: Fiber and Cement Shingles**
- Appearance
- Characteristics

### Unit 9: Other Roof Topics

**Lesson 1: Ventilation**
- Effects of Improper Ventilation
- Vapor Barrier
- Air Flow
- Vent
Lesson 2: Wallpaper
Types of Rolled Wall Covering
Preparation for Wallpaper
Removing Wallpaper
Installing Wallpaper
Wallpaper Cost
Wallpaper Rolls, Waste, & Borders

Block 9 - Cabinets, Floor Coverings and Other Final Finishes

Unit 1: Cabinets & Countertops
Lesson 1: Assessing Cabinets
Five Criteria
Joints
Hardware
Construction
Style
Material
Lesson 2: Recognizing Wood
Wood Veneers
Recognizing Wood Grains
Veneer Lay
Eight Basic Wood Grains
Lesson 3: Judging Cabinets
Using the Five Criteria
Lesson 4: Installing Cabinets
Cabinet Construction
Cabinet Installation
Lesson 5: Countertops
Countertop Materials
Plastic Laminate Countertops
Solid Plastic Countertops
Tile, Wood, and Stone Countertops

Unit 2: Floor Covering
Lesson 1: Carpet Quality
Carpet Materials
Judging Carpet Quality
Lesson 2: Carpet Pad and Carpet Installation
Carpet Pad
Carpet Installation
Lesson 3: Tile
Types of Tile
Tile Installation
Lesson 4: Vinyl
Vinyl Quality
Types of Underlayment
Underlayment Installation
Vinyl Installation
Common Problems
Lesson 5: Wood
Wood Quality and Expense
Wood Styles
Direction
Wood Installation
Common Problems
Lesson 6: Other Floor Finishes
Stone Floors
Brick, Pavers, and Terrazzo

Unit 3: Finish Hardware
Lesson 1: Finish Hardware
Finish Hardware

Unit 4: Finish HVAC and Electrical
Lesson 1: Finish HVAC and Electrical
Finish HVAC & Electrical Installation
Quality and Cost of Light Fixtures

Unit 5: Finishing the Rooms
Lesson 1: Bathrooms
Cost of Tubs, Sinks and Faucets
Showers and Tub Surrounds
Tub and Shower Doors
Water Closets
Mirrors and Medicine Cabinets
GFCI Outlets
Lesson 2: Kitchens
Appliances
Kitchen Sinks
Refrigerator Plumbing
Lesson 3: Laundry Rooms
Laundry Room Plans
Laundry Sinks
Fold-Out Ironing Boards
Lesson 4: Stairs
Finish Treads and Risers
Balustrades and Hand Rails
Spiral And Pre-Manufactured Stairs
Installing Carpet on Stairs

Block 10 - How to Inspect

Unit 1: Investigating a Loss
Lesson 1: The Six Points of Estimation
The Six Points
Perspective
Organization
Identification
Number
Technique
Supporting Events
Lesson 2: Diagramming
An Effective Diagram
Rectangular Rooms with Flat Ceilings
Other Room Shapes
Roofs and Exterior
Lesson 3: Safety Issues and Damage Clues
Electrical Safety
Structural Compromise
Other Safety Issues

Unit 2: Common Losses and Repair Issues
Lesson 1: Fire Damage
Four Fire Factors
Sources of Heat, Fuel, & Oxygen
Smoke Damage & Hidden Damage
Charring
Repairability and Supporting Events
Lesson 2: Common Repair Issues
Removing Sources of Odor
Cleaning
Sealing
Natural Breaks
Lesson 3: Other Repair Issues
Odor Control
Deciding Whether to Clean or Replace
Lesson 4: Water Damage
Water Extraction & Dehydration
The Effects of Moisture
Lesson 5: Vehicle Collision & Earthquake Damage
Footing & Foundation System
Damage
Framing Damage
Surface Finish Damage
Lesson 6: High Wind Losses
Structural Damage
Roofing Damage
Emergency Board-up