Western Technical College

31410358 Residential Construction

Course Outcome Summary

Course Information

Description	In this course, students will construct a home on a building site in the City of La Crosse. On site tasks will include foundation prep, load bearing wall and floor system installation, exterior and interior wall construction, roof truss installation and roof finish, stair construction, and cornice construction. Students will apply on site safety techniques and scaffolding installation as part of their training.
Career Cluster	Architecture and Construction
Instructional Level	Technical Diploma Courses
Total Credits	5
Total Hours	180

Textbooks

No textbook required.

Learner Supplies

Safety glasses with side eye protection that meet Z87 OSHA guidelines. **Vendor:** Campus Shop. Required.

Tools: Tool belt, 25' - 1" tape measure, 16 or 20 oz. hammer, speed square, chalk line, utility knife, wood chisels (1/4, 1/2, 3/4, 1"). **Vendor:** To be discussed in class. Required.

Proper work boots - $35.00-75.00. **Vendor:** To be discussed in class. Required.

Cold weather workwear: work gloves, hat, insulated bibs/coveralls, insulated winter boots. **Vendor:** To be discussed in class. Optional.

Scientific Calculator - $20. **Vendor:** Campus Shop. Required.

Experiential Learning

1. Community Based Learning Project
2. Work Based Learning

Program Outcomes

1. Use hand and power tools and equipment.
2. Apply industry recognized safety practices and procedures.
3. Interpret construction drawings.
4. Interpret building codes.
5. Demonstrate industry building practices and material application.
6. Recommend a plan of procedure to eliminate wasted time and materials.

Course Competencies

1. Analyze code requirements for residential framing from the Wisconsin Uniform Dwelling Code.

Assessment Strategies

1.1. Performance
1.2. Written Objective Test

Criteria

You will know you are successful when:

1.1. you identify local requirements from the Wisconsin Uniform Code to include: floor bearing requirements, stairwell openings, wall configuration within a home, header size and design, and rafter plate installation.
1.2. you identify local requirements from the Wisconsin Uniform Dwelling Code to include: Stair construction requirements and design, truss connector plates, and joist hanger applications within a structure.
1.3. you construct assemblies that meet or exceed the requirements of the Wisconsin Uniform Dwelling code.
1.4. you pass an exam with a minimum score of 70%.

Learning Objectives

1.a. Identify code requirements relating to floor and wall construction.
1.b. Identify code requirments relating to stair construction and metal connectors.

2. Explore the use of fasteners and metal connectors used in framing.

Assessment Strategies

2.1. Written Objective Test
2.2. Skill Demonstration

Criteria

You will know you are successful when:

2.1. you identify the location of joist hangers from a floor framing plan.
2.2. you install a joist hanger using correct fastening techniques.
2.3. you describe the correct placement of fasterners used in floor joist and sub-floor installation.
2.4. you select the proper fasteners used to construct a wall.
2.5. you demonstrate proper nailing techniques used for wall assembly.
2.6. you pass a written exam with a minimum score of 70%.

Learning Objectives

2.a. Identify metal connectors used in floor and wall framing.
2.b. Identify different fasteners used in wall and floor framing.

3. Prepare a foundation for back-fill.

Assessment Strategies

3.1. On-the-job Performance

Criteria

You will know you are successful when:

3.1. you apply foundation damp-proofing materials in an even coat with 100% coverage.
3.2. you install foundation bracing at the appropriate locations to withstand the pressure of foundation backfill.
3.3. you install egress window wells at the appropriate height above finish grade using correct fastening techniques as instructed.

Learning Objectives

3.a. Apply foundation damp-proofing.
3.b. Install foundation bracing.
3.c. Install egress window wells.

4. Frame an engineered floor system.

Assessment Strategies

4.1. On-the-job Performance

Criteria

You will know you are successful when:

4.1. you fasten sill sealer and sill plates to the top of the foundation at the correct location according to the plans.
4.2. you frame load bearing walls at the correct location and elevation to provide consistent bearing for floor trusses.
4.3. you correctly label the positions of all through-floor plumbing fixtures.
4.4. you correctly perform an on-center layout to determine the location of every floor truss.
4.5. you fasten floor trusses to the sill plate in the correct locations according to the plans using appropriate fastening techniques.
4.6. you install all permanent floor truss bracing and stiff-backs according to the manufacturer's specifications.
4.7. you fasten subfloor material to the floor trusses using the correct adhesive and nailing pattern.

Learning Objectives

4.a. Install sill plate materials.
4.b. Frame load bearing walls.
4.c. Locate plumbing fixtures from a floor plan.
4.d. Lay-out sill plates for floor truss installation.
4.e. Install floor trusses according to the manufactureres specifications.
4.f. Install subfloor.

5. Frame exterior walls.

Assessment Strategies

5.1. On-the-job Performance

Criteria

You will know you are successful when:

5.1. you reference the plans to locate the correct position of window and door rough openings on the plates and places an on-center layout for common stud locations.
5.2. you cut all trimmers, headers, sills, and cripples to the appropriate size in order to provide the correct dimensions for door and window rough openings.
5.3. you install all wall framing components in the correct order at the locations marked out on the plates.
5.4. you adjust the wall to achieve squareness.
5.5. you install exterior wall sheathing and house wrap on the assembled wall.
5.6. you position exterior walls in their permanent locations using proper fastening and bracing techniques.

Learning Objectives

5.a. Lay-out exterior wall plates.
5.b. Cut wall framing components to the proper length.
5.c. Assemble wall framing components.
5.d. Install exterior wall sheathing.
5.e. Install house wrap.
5.f. Position exterior walls in their final locations.

6. Frame interior walls.

Assessment Strategies

6.1. On-the-job Performance

Criteria

You will know you are successful when:

6.1. you reference the plans to locate walls within the home in order to define room sizes and locations.
6.2. you reference the plans to locate the correct size and position of door rough openings on the plates and places an on-center layout for common stud locations.
6.3. you cut all trimmers, headers, and cripples to the appropriate size in order to provide the correct dimensions for door rough openings.
6.4. you install all wall framing components in the correct order at the locations marked out on the plates.
6.5. you position interior walls in their permanent locations using proper fastening techniques.
6.6. you connect all walls together with double-top plates, maintaining plumb and room squareness.

Learning Objectives

6.a. Locate position of interior walls within the home from a set of plans.
6.b. Lay-out interior wall plates.
6.c. Cut wall framing components to the proper length.
6.d. Assemble wall framing components.
6.e. Position interior walls in their final locations.
6.f. Install double-top plates in a overlapping manner according to code.

7. Identify engineered roof truss systems and its components.

Assessment Strategies

7.1. Written Objective Test

Criteria

You will know you are successful when:

7.1. you correctly identify a framed roof that utilizes engineered roof trusses.
7.2. you correctly identify different types of manufactured trusses.
7.3. you correctly label the parts of a webbed truss.
7.4. you identify roof sheathing.
7.5. you describe the use of metal connectors within an engineered roof system.
7.6. you articulate information used on a MiTek drawing.
7.7. you pass a written exam with a minimum score of 70%.

Learning Objectives

7.a. Differentiate between a hand framed roof and an engineered truss roof.
7.b. Label the members used to construct a truss.
7.c. Identify metal connectors used in truss installation.
7.d. Identify roof sheathing specifications
7.e. Interpret a MiTek drawing.

8. Prepare a structure for roof truss installation.

Assessment Strategies

8.1. On-the-job Performance

Criteria

You will know you are successful when:

8.1. you erect scaffolding to provide safe working conditions for the installation of roof trusses.
8.2. you straighten exterior walls utilizing a dry-line and securely brace the walls in the correct position.
8.3. you perform an on-center layout to locate the final position of roof trusses utilizing the MiTek drawings for individual truss locations.

Learning Objectives

8.a. Assemble scaffolding.
8.b. Straighten exterior walls.
8.c. Lay-out rafter plates.

9. Install an engineered roof system.

Assessment Strategies

9.1. On-the-job Performance

Criteria

You will know you are successful when:

9.1. you fasten roof trusses in the proper locations using appropriate installation techniques.
9.2. you install permanent truss bracing according to the engineer's specifications.
9.3. you build and install gable end lookouts as instructed.
9.4. you cut rafter tails and installs sub-fascia to achieve the desired overhang.
9.5. you install roof sheathing maintaining proper truss spacing and utilizing appropriate fastening techniques.

Learning Objectives

9.a. Fasten roof trusses in the proper location.
9.b. Install permanent truss bracing.
9.c. Install gable end lookouts.
9.d. Install sub-fascia.
9.e. Install roof sheathing.

10. Frame cornice returns.

Assessment Strategies

10.1. On-the-job Performance

Criteria

You will know you are successful when:

10.1. you correctly identify the style of cornice return used from the architectural drawings.
10.2. you cut and install the components of the cornice return maintaining proper roof and gable end wall plane.
10.3. you demonstrate safe use of pneumatic nail guns.
10.4. you demonstrate safe use of electric drills.

Learning Objectives

10.a. Identify the type of cornice return as illustrated on the blueprints
10.b. Build a cornice return

11. Install roof finish materials and accessories.

Assessment Strategies

11.1. On-the-job Performance

Criteria

You will know you are successful when:

11.1. you install all roofing underlayment maintaining a proper overlap.
11.2. you cut and install a drip edge over the under layment at the rake and under the enderlayment at the eaves.
11.3. you install asphalt shingles maintaining the proper step sequence for each row and nailing pattern according to the manufacturer's specifications.
11.4. you install all step and vent stack flashing maintaining a proper drainage plane to prevent leakage.
11.5. you install ridge vent and shingle cap according to the manufacturer's specifications.
11.6. you demonstrate safe use of pneumatic roofing gun.

Learning Objectives

11.a. Install roof underlayment, ice and water shield, and drip edge.
11.b. Install starter strip and asphalt shingles.
11.c. Install step flashing, vent stack flashing, ridge vent, and ridge cap.
11.d. Use a pneumatic roofing gun and proper fasteners.

12. Install soffit and fascia.

Assessment Strategies

12.1. On-the-job Performance

Criteria

You will know you are successful when:

12.1. you cut and install the F-channel to provide a level installation of the soffit pan.
12.2. you cut and install the soffit pan square with the exterior wall keeping the pans interlocked properly.
12.3. you install the finish fascia, inserting it under the drip edge to maintain a proper drainage plane, without damaging the finished product.
12.4. you utilize a pneumatic or cordless staple gun in a safe and effective manner.

Learning Objectives

12.a. Install F-channel.
12.b. Install alluminum soffit pan.
12.c. Install alluminum fascia.
12.d. Utilitze a pneumatic or cordless staple gun.

13. Install windows.

Assessment Strategies

13.1. On-the-job Performance

Criteria

You will know you are successful when:

13.1. you cut the house wrap and install sill flashing within the window rough opening.
13.2. you shim and fasten the window securely within the rough opening square, level, and plumb, without binding the operating sash, in accordance to the manufacturer's specifications.
13.3. you apply tape and drip cap to the exterior of the window, maintaining a proper drainage plane.

Learning Objectives

13.a. Prepare a rough opening for window installation.
13.b. Install a window.
13.c. Apply aluminum drip cap and window flashing.

14. Install exterior doors.

Assessment Strategies

14.1. On-the-job Performance

Criteria

You will know you are successful when:

14.1. you install sill flashing in the door rough opening to protect subfloor materials from moisture damage.
14.2. you set the door threshold in a bed of caulk and shims, and fasten the door securely within the rough opening square, level, and plumb.
14.3. you install the door maintaining an equal margin at the head and strike side of the jamb to ensure proper sealing and operation of the door slab.
14.4. you apply tape and drip cap to the exterior side of the door maintaining a proper drainage plane.
14.5. you install door hardware properly.

Learning Objectives

14.a. Prepare a rough opening for exterior door installation.
14.b. Install an exterior door.
14.c. Apply door flashing and aluminum drip cap.