



Western Technical College

10614124 Structural Drafting - Residential

Course Outcome Summary

Course Information

Description This course enables beginning architectural students to understand load distribution and to coordinate structural building components within a residential structure. Foundation systems, framing design with dimensional lumber and engineered wood products, along with applicable codes will be examined. Load tables and member sizing software will be utilized to specify framing for use in computer generated structural plans and details of a residence.

Career Cluster Architecture and Construction

Instructional Level Associate Degree Courses

Total Credits 3

Total Hours 90

Pre/Corequisites

Prerequisite 10804107 College Mathematics

Pre/Corequisite 10614122 Architectural Drafting - Residential

Textbooks

No textbook required.

Learner Supplies

Architectural Technology Kit. **Vendor:** Campus Shop. Required.

Success Abilities

1. Cultivate Passion: Expand a Growth-Mindset
2. Live Responsibly: Embrace Sustainability

Program Outcomes

1. Develop construction documents
2. Evaluate building materials
3. Develop building designs
4. Integrate building systems

Course Competencies

1. Identify building code requirements.

Assessment Strategies

- 1.1. Written Objective Test

Criteria

You will know you are successful when

- 1.1. you locate information in Wisconsin Uniform Dwelling Code.
- 1.2. you apply code requirements to residential buildings.
- 1.3. you identify code structural requirements.

Learning Objectives

- 1.a. Review Wisconsin state website for code information.
- 1.b. Locate information in Wisconsin Uniform Dwelling Code.
- 1.c. Apply code requirements to residential buildings.
- 1.d. Identify code structural requirements.

2. Identify the components and materials used in residential foundations.

Assessment Strategies

- 2.1. Written Product

Criteria

You will know you are successful when

- 2.1. you label basic foundation components on architectural drawings.
- 2.2. you describe the basic elements of residential foundation systems.
- 2.3. you compare various foundation systems.

Learning Objectives

- 2.a. Describe the basic elements of residential foundation systems.
- 2.b. Examine various architectural drawings depicting foundation details.
- 2.c. Identify basic foundation components on architectural drawings.
- 2.d. Investigate ICF foundation systems.
- 2.e. Investigate wood foundation systems.
- 2.f. Investigate concrete masonry unit foundation systems.

3. Develop foundation plans using CAD/BIM software.

Criteria

You will know you are successful when

- 3.1. you generate foundation plan for existing garage plan.
- 3.2. you generate foundation plan for existing floor plan.
- 3.3. you analyze existing foundation plan for standard information.
- 3.4. you analyze existing foundation plan for dimension requirements.
- 3.5. you duplicate outline of foundation drawing requirements.

Learning Objectives

- 3.a. Coordinate foundation requirements with given floor plan.
- 3.b. Determine required dimensions to include on residential foundation plans.
- 3.c. Determine required information to include on residential foundation plans.
- 3.d. Utilize a foundation plan drawing checklist to ensure accuracy.

4. Identify the components and materials used in floor framing systems.

Criteria

You will know you are successful when

- 4.1. you identify various architectural drawings depicting floor framing details.
- 4.2. you label basic floor framing components on architectural drawings

Learning Objectives

- 4.a. Identify the basic elements of residential floor framing systems.
- 4.b. Assess different materials used for residential floor framing systems.
- 4.c. Investigate I-Joist floor framing systems.
- 4.d. Investigate floor truss floor framing systems.
- 4.e. Investigate dimensional lumber floor framing systems.
- 4.f. Investigate OVE techniques used in floor framing systems.

5. Develop floor framing plans using CAD/BIM software.

Criteria

You will know you are successful when

- 5.1. you generate I-Joist floor framing plan for existing plan.
- 5.2. you generate dimensional lumber floor framing plan for existing plan.
- 5.3. you generate floor truss framing plan for existing plan.
- 5.4. you analyze existing floor framing plans for standard information.
- 5.5. you analyze existing floor framing plans for dimension requirements.
- 5.6. you duplicate outline of floor framing plan drawing requirements.

Learning Objectives

- 5.a. Coordinate floor framing requirements with given floor plan.
- 5.b. Determine required dimensions to include on residential floor framing plans.
- 5.c. Determine required information to include on residential floor framing plans.
- 5.d. Utilize a floor framing plan drawing checklist to ensure accuracy.

6. Identify the components and materials used in wall framing systems.

Criteria

You will know you are successful when

- 6.1. you examine various architectural drawings depicting wall framing details.
- 6.2. you label basic wall framing components on architectural drawings.
- 6.3. you present SIP findings in research paper formatted according to class expectations.

Learning Objectives

- 6.a. Describe the basic elements of residential wall framing systems.
- 6.b. Assess different materials used for residential wall framing systems.
- 6.c. Investigate dimensional lumber wall framing systems.
- 6.d. Investigate OVE techniques used in wall framing systems.
- 6.e. Investigate SIP wall framing systems.

7. Develop wall framing plans and diagrams using CAD/BIM software.

Criteria

You will know you are successful when

- 7.1. you generate wall framing plan for existing plan.
- 7.2. you generate wall framing diagrams for existing plan.
- 7.3. you generate wall framing plan utilizing OVE techniques for same existing plan.
- 7.4. you generate wall framing diagrams utilizing OVE techniques for same existing plan.

- 7.5. you analyze existing wall framing plans for standard information.
- 7.6. you analyze existing wall framing diagrams for standard information.
- 7.7. you analyze existing wall framing plans for dimension requirements.
- 7.8. you analyze existing wall framing diagrams for dimension requirements.
- 7.9. you duplicate outline of wall framing plan and diagram drawing requirements.

Learning Objectives

- 7.a. Coordinate wall framing requirements with given floor plan.
- 7.b. Determine required dimensions to include on residential wall framing plans.
- 7.c. Determine required dimensions to include on residential wall diagrams.
- 7.d. Determine required information to include on residential wall framing plans.
- 7.e. Determine required information to include on residential wall framing diagrams.
- 7.f. Utilize a wall framing plan and wall diagram drawing checklist to ensure accuracy.

8. Identify the components and materials used in roof framing systems.

Criteria

You will know you are successful when

- 8.1. you examine various architectural drawings depicting roof framing details.
- 8.2. you label basic roof framing components on architectural drawings.

Learning Objectives

- 8.a. Describe the basic elements of residential roof framing systems.
- 8.b. Assess different materials used for residential roof framing systems.
- 8.c. Investigate rafter roof framing systems.
- 8.d. Investigate trussed roof framing systems.
- 8.e. Investigate roof design and impact on framing.

9. Develop roof framing plans using CAD/BIM software.

Criteria

You will know you are successful when

- 9.1. you generate roof framing plan for existing plan.
- 9.2. you generate roof framing diagrams for existing plan.
- 9.3. you analyze existing roof framing plans for standard information.
- 9.4. you analyze existing roof framing diagrams for standard information.
- 9.5. you analyze existing roof framing plans for dimension requirements.
- 9.6. you analyze existing roof framing diagrams for dimension requirements.
- 9.7. you duplicate outline of wall framing plan and diagram drawing requirements.

Learning Objectives

- 9.a. Coordinate roof framing requirements with given floor plan.
- 9.b. Determine required dimensions to include on residential roof framing plans.
- 9.c. Determine required dimensions to include on residential roof truss diagrams.
- 9.d. Determine required information to include on residential roof framing plans.
- 9.e. Determine required information to include on residential roof truss diagrams.
- 9.f. Utilize a roof framing plan and roof diagram drawing checklist to ensure accuracy.

10. Define residential building section requirements.

Criteria

You will know you are successful when

- 10.1. you examine various architectural drawings depicting sections.
- 10.2. you label basic components on wall sections.
- 10.3. you investigate architectural set of drawings for coordination of plan and sections.
- 10.4. you select scale for type of section used.
- 10.5. you select symbols used in section drawings.

Learning Objectives

- 10.a. Differentiate between three types of sections used in construction documents.
- 10.b. Specify the factors that influence the choice of scale used.
- 10.c. Indicate drafting conventions used to show cutting planes on architectural plans.

- 10.d. Specify appropriate notes for building components shown in section.
- 10.e. Specify appropriate material symbol used in section drawings.

11. Develop residential sections using CAD/BIM software.

Criteria

You will know you are successful when

- 11.1. you draft residential building section.
- 11.2. you draft residential wall section.
- 11.3. you dimension residential building section.
- 11.4. you dimension residential wall section.
- 11.5. you place information on building section.
- 11.6. you place information on wall section.

Learning Objectives

- 11.a. Incorporate section cut lines on plan view.
- 11.b. Layout building sections.
- 11.c. Modify objects and lines in building section.
- 11.d. Incorporate section details
- 11.e. Determine dimensioning requirements for building sections.
- 11.f. Determine notation requirements for building sections.