Western Technical College

10614134 Structural Drafting - Commercial

Course Outcome Summary

Course Information

Description	This course guides intermediate architectural students through the interpretation process necessary to communicate the structural design of commercial buildings. Concrete foundation systems and components combined with steel and masonry structures will be studied. Students will employ engineering sketches, industry manuals, and AutoCAD along with the advanced steel detailing software SDS/2 as aids in preparing drawings and designing connections.
Career Cluster	Architecture and Construction
Instructional Level	Associate Degree Courses
Total Credits	3
Total Hours	90

Pre/Corequisites

Prerequisite	10804107 College Mathematics
Pre/Corequisite	10614132 Architectural Drafting - Commercial
Prerequisite	10614106 Architectural CAD

Textbooks

Design Integration Using Autodesk Revit 2022. Copyright 2021. Stine, Daniel John. Publisher: Schroff Development Corporation. **ISBN-13**: 978-1-63057-451-2. Required.

Success Abilities

1. Refine Professionalism: Improve Critical Thinking
2. Refine Professionalism: Participate Collaboratively

Program Outcomes

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

Course Competencies

1. Investigate structural drafting field

Assessment Strategies

1.1. By participating in a class discussion.
1.2. By answering chapter review questions.
1.3. By performing a local structural drafting job search.
1.4. By performing a state-wide structural drafting job search.
1.5. By performing a national structural drafting job search.

Criteria

Your performance will be successful when:

1.1. Learner completes review questions with a 70% minimum accuracy.
1.2. Job search results list sources of posting.
1.3. Job search results list location of jobs.
1.4. Job search results list qualifications required to apply.
1.5. Job search results list duties or basic description.

Learning Objectives

1.a. Define structural drafting
1.b. Identify various types of structural drawings
1.c. List the most common employers of structural CAD technicians
1.d. Explain the role of CAD in structural drafting

2. Explore structural product fabrication processes

Assessment Strategies

2.1. By participating in a class discussion.
2.2. By answering chapter review questions.
2.3. By drafting various structural member shapes.

Criteria

Your performance will be successful when:

2.1. Learner completes review questions with a 70% minimum accuracy.
2.2. CAD drawing reflects accurate representation of specified structural member shapes.
2.3. CAD drawing contains all specified shapes.
2.4. CAD drawing contains labels for each shape.
2.5. CAD drawing is hatched per industry standards.
2.6. CAD drawing is printed to scale on completed titleblock.

Learning Objectives

2.a. Explain the product fabrication process for structural steel
2.b. Explain the product fabrication process for precast concrete
2.c. Differentiate between precast concrete and poured-in-place concrete
2.d. Discuss shipping methods for structural building products

3. Compare structural connectors

Assessment Strategies

3.1. By participating in a class discussion.
3.2. By answering chapter review questions.
3.3. By drafting various weld symbols.

Criteria

Your performance will be successful when:

3.1. Learner completes review questions with a 70% minimum accuracy.
3.2. CAD drawing contains all specified symbols.
3.3. CAD drawing contains written specifications for each symbol.
3.4. CAD drawing symbols are represented per industry standards.
3.5. CAD drawing is printed to scale on completed titleblock.

Learning Objectives

3.a. Differentiate between bolted, welded, and riveted connections
3.b. Compare the applications of split-rings and shear plates
3.c. Interpret welding symbols

4. Construct structural steel framing plans

Assessment Strategies

4.1. By participating in a class discussion.
4.2. By answering chapter review questions.
4.3. By drafting various structural steel framing plans.

Criteria

Your performance will be successful when:

4.1. Learner completes review questions with a 70% minimum accuracy.
4.2. Column framing plan contains accurate information that matches provided engineer's sketch.
4.3. Column schedule contains accurate information that matches provided engineer's sketch.
4.4. Beam framing plan contains accurate information that matches provided engineer's sketch.
4.5. Framing drawings are printed to scale on completed titleblock.

Learning Objectives

4.a. Distinguish between engineering drawings and shop drawings
4.b. Describe various structural steel products identified in framing plans
4.c. Illustrate various structural steel products identified in framing plans
4.d. Utilize the AISC Manual of Steel Construction to determine various steel product dimensions

5. Develop structural steel sections

Assessment Strategies

5.1. By participating in a class discussion.
5.2. By answering chapter review questions.
5.3. By drafting various structural steel sections.

Criteria

Your performance will be successful when:

5.1. Learner completes review questions with a 70% minimum accuracy.
5.2. Section drawings only show load-bearing features.
5.3. Section drawings show accurate representations of specified materials.
5.4. Section drawings reflect specified height information.
5.5. Section drawings are printed to scale on completed titleblock.

Learning Objectives

5.a. Differentiate between full, partial, and offset section
5.b. Differentiate between the two types of full sections
5.c. Explain how sections are used in structural steel drafting
5.d. Compare requirements for drafting symbolic sections and scaled drawings

6. Develop structural steel connection details

Assessment Strategies

6.1. By participating in a class discussion.
6.2. By answering chapter review questions.
6.3. By drafting structural steel connection details.

Criteria

Your performance will be successful when:

6.1. Learner completes review questions with a 70% minimum accuracy.
6.2. Details show accurate representations of specified materials.
6.3. Details include labels and notes to indicate materials.
6.4. Details contain a plan view of the connection.
6.5. Details are printed to scale on completed titleblock.

Learning Objectives

6.a. Explain the purpose of structural steel connection details
6.b. List the required information necessary to draft connection details
6.c. Compare various types of structural steel connections

7. Utilize advanced steel detailing software to document structural design aspects of a building

Assessment Strategies

7.1. By developing a 3D structural steel model.
7.2. By generating 2D structural steel details.
7.3. By plotting 2D structural steel detail sheets.

Criteria

Your performance will be successful when:

7.1. Structural steel model contains all information shown on given design.
7.2. Member connections match given structures design.
7.3. Plotted sheets contain titleblocks with correct information.
7.4. Plotted sheets are printed to scale.
7.5. Plotted sheets contain all details to match given structures design.

Learning Objectives

7.a. Assign values to setup options
7.b. Create views of a structural steel 3D model
7.c. Navigate within a structural steel 3D model
7.d. Develop a structural steel 3D model with various member types
7.e. Generate various 2D structural steel details
7.f. Produce a hard copy of structural steel drawings

8. Construct precast concrete framing plans

Assessment Strategies

8.1. By participating in a class discussion.
8.2. By answering chapter review questions.
8.3. By drafting precast concrete framing plans.

Criteria

Your performance will be successful when:

8.1. Learner completes review questions with a 70% minimum accuracy.
8.2. Framing plans include a plan-view layout of all structural members.
8.3. Framing plans include mark numbers for each member.
8.4. Framing plans include a completed product schedule.
8.5. Framing plans include general notes.
8.6. Framing plans include a legend.
8.7. Framing plans include a north arrow.
8.8. Framing plans include complete dimensions.
8.9. Framing plans include centerline of column designations.
8.10. Framing plans are printed to scale on completed titleblock.

Learning Objectives

8.a. Identify information required on precast concrete framing plans
8.b. Outline procedures to draft precast concrete column framing plans
8.c. Outline procedures to draft precast concrete beam framing plans
8.d. Outline procedures to draft precast concrete floor/roof framing plans

8.e. Outline procedures to draft precast concrete wall panel framing plans

9. Develop precast concrete sections

Assessment Strategies

9.1. By participating in a class discussion.
9.2. By answering chapter review questions.
9.3. By drafting precast concrete sections.

Criteria

Your performance will be successful when:

9.1. Learner completes review questions with a 70% minimum accuracy.
9.2. Section drawings only show load-bearing features.
9.3. Section drawings show accurate representations of specified materials.
9.4. Section drawings reflect specified height information.
9.5. Section drawings are printed to scale on completed titleblock.

Learning Objectives

9.a. Define precast sections
9.b. Illustrate examples of precast concrete section conventions
9.c. Outline procedures to draft precast concrete sections

10. Develop precast concrete connection details

Assessment Strategies

10.1. By participating in a class discussion.
10.2. By answering chapter review questions.
10.3. By drafting various precast concrete connection details.

Criteria

Your performance will be successful when:

10.1. Learner completes review questions with a 70% minimum accuracy.
10.2. Details show accurate representations of specified materials.
10.3. Details include labels and notes to indicate materials.
10.4. Details contain a plan view of the connection.
10.5. Details are printed to scale on completed titleblock.

Learning Objectives

10.a. Identify requirements to draft various types of precast concrete connections
10.b. Outline procedures to draft precast concrete baseplate connection details
10.c. Outline procedures to draft precast concrete bolted connection details
10.d. Outline procedures to draft precast concrete welded connection details
10.e. Outline procedures to draft precast concrete haunch connection details

11. Explore requirements for detailing poured-in-place concrete components

Assessment Strategies

11.1. By participating in a class discussion.
11.2. By answering chapter review questions.
11.3. By drafting poured-in-place concrete details.

Criteria

Your performance will be successful when:

11.1. Learner completes review questions with a 70% minimum accuracy.
11.2. Details show accurate representations of specified materials.
11.3. Details include labels and notes to indicate materials.
11.4. Details are printed to scale on completed titleblock.

Learning Objectives

11.a. List four basic categories of poured-in-place concrete walls
11.b. Identify various types of concrete walls
11.c. Differentiate between two basic types of poured-in-place concrete columns
11.d. Differentiate between ground-supported and suspended floor systems

11.e. Recognize various types of poured-in-place concrete floor systems

12. Develop poured-in-place concrete stair sections

Assessment Strategies

12.1. By participating in a class discussion.
12.2. By answering chapter review questions.
12.3. By drafting a poured-in-place concrete stair section.

Criteria

Your performance will be successful when:

12.1. Learner completes review questions with a 70% minimum accuracy.
12.2. Section shows accurate representations of specified materials.
12.3. Section includes labels and notes to indicate materials.
12.4. Section includes dimensions to indicate sizes of materials.
12.5. Section reflects specified height information.
12.6. Section is printed to scale on completed titleblock.

Learning Objectives

12.a. Sketch examples of the various types of stairs
12.b. Perform stair design computations
12.c. Outline necessary information required to draft poured-in-place concrete stair sections