CNST-1411: CAD TECHNOLOGY IN CONSTRUCTION

Cuyahoga Community College

Viewing: CNST-1411 : CAD Technology in Construction

Board of Trustees:
October 2024

Academic Term:
Fall 2025

Subject Code
CNST - Construction Engineering Tech

Course Number:
1411

Title:
CAD Technology in Construction

Catalog Description:
Working drawing techniques of domestic structures using computer-aided drafting software. Floor plans, foundation plans, wall-sections, elevations, site plans and dimensioning techniques will be the core concepts.

Credit Hour(s):
2

Lecture Hour(s):
1

Lab Hour(s):
3

Requisites

Prerequisite and Corequisite
CNST-1290 Construction Print Reading; or departmental approval.

Outcomes

Course Outcome(s):
Recognize common drawing scales used for architectural drawings.

Objective(s):
1. Utilize Computer-Aided Drafting (CAD) software to represent full size information with appropriate drawing scale output.
2. Use an existing set of architectural drawings as examples showing different drawing scales.

Course Outcome(s):
Recognize the traditional format of architectural drawings.

Objective(s):
1. Explain the need for different types of drawings required for the traditional format based on aspects of construction.
2. Review an existing set of drawings as an example of the traditional format.
3. Recognize basic dimensioning techniques required for architectural drawing.

Course Outcome(s):
Develop working drawings for a domestic structure.

Objective(s):
1. Use CAD software commands to generate all geometry and text for exterior elevations.

2. Use CAD software commands to generate all geometry and text for structural wall sections.
3. Use CAD software commands to generate all geometry and text for structural site plans.
4. Practice sketching techniques with 1/4" grid paper.
5. Replicate common architectural symbols used in drawings.
6. Use CAD software commands to generate all geometry and text for structural floor plans.
7. Use CAD software commands to generate all geometry and text for structural foundation plans.

Course Outcome(s):

Recognize basic framing systems used for domestic structures.

Objective(s):

1. Differentiate between "balloon framing" and "platform framing."
2. Depict the structural components, and component sizes, used in basic framing systems.

Course Outcome(s):

Exhibit drafting skills and skill progression with CAD software commands.

Objective(s):

1. Develop task-oriented patterns associated with the length of time to complete portions of a drawing.
2. Used existing CAD drawing components to generate a new drawing at a faster time rate.
3. Format appropriate text styles required for architectural drawings.
4. Format appropriate dimension styles required for architectural drawings.
5. Format drawing size limits needed to contain all drawing elements.

Methods of Evaluation:

1. Written assignments
2. Laboratory assignments
3. Participation and discussion
4. Quizzes
5. Final exam/project

Course Content Outline:

1. Residential working drawings
    a. Floor plans
        i. wall thickness and materials
        ii. room sizes
        iii. room layout patterns
        iv. object representations
        v. door types
        vi. window types
        vii. dimensioning procedures
        viii. appliance and fixture sizes
        ix. stair layout
        x. basement plans
    b. Foundation plans
        i. concrete footings
        ii. footing depth
        iii. foundation walls
        iv. drainage and waterproofing
        v. step footings
        vi. reinforcement

vii. soil boring considerations
viii. dimensioning procedures

c. Wall sections
i. foundation details
ii. first-floor details
iii. second-floor details
iv. roof details

d. Roof plans
i. roof types
ii. ridge beams
iii. hips & valleys
iv. dormers
v. ventilation
vi. overhang

e. Exterior elevations
i. relationship to wall section for determining height
ii. door and window details
iii. use of hidden lines to indicate footings & foundation
iv. finish materials and material details

f. Door and window schedules
i. information required for schedules
ii. placement of schedules

g. Site plans
i. building footprint
ii. property description
iii. topography
iv. utility locations
v. yard setback distances
vi. driveways, parking, asphalt and concrete courts/patios
vii. bodies of water, streams, pools, etc.
viii. building floor elevations

2. Drawing sheet sizes
a. common sheet sizes
3. Drawing scales
a. architectural scales
b. engineering scales
4. Sketching techniques
a. use of 1/4" grid paper
b. use of sketches to determine geometry dimensions
5. AutoCAD software commands
a. "Draw" commands
b. object tracking
c. "Modify" commands
d. "View" commands
e. basic drawing setup
f. object properties
g. "Object Snap"
h. "Dimension" commands
i. "Plot" commands

The Course Schedule is subject to change due to pedagogical needs, instructor discretion, parts of term, and unexpected events.

Resources for the Instructor

Stine, D. J. (2024) *Residential design using AutoCAD 2025*, SDC Publications.

Richard, P. & Fitzgerald, J. (2007) *Introduction to AutoCAD 2007*, Upper Saddle River, NJ:Prentice Hall.

Stine, D. J. (2021) *Residential design using AutoCAD 2022*, SDC Publications.

Baumback, W. (2021) *Introduction to drafting and AutoCAD3D*, Vancouver Community College. https://opentextbc.ca/autocad2d/

Additional Resources for the Instructor

- Whitton, A. (2022). MyCADSite. https://www.mycadsite.com/
- OHDOT CADD Engineering Standards Manual. (2024). https://www.transportation.ohio.gov/working/engineering/cadd-mapping/cadd-standards-manual-ohdot (https://www.transportation.ohio.gov/working/engineering/cadd-mapping/cadd-standards-manual-ohdot/)
- AutoDesk's AutoCAD YouTube Channel. https://www.youtube.com/c/autocad (https://www.youtube.com/c/autocad/)
- City of Akron Engineering Standard Drawings. https://www.akronohio.gov/cms/engineering/operationssupport_admin_standarddwgs/index.html (https://www.akronohio.gov/cms/engineering/operationssupport_admin_standarddwgs/)

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