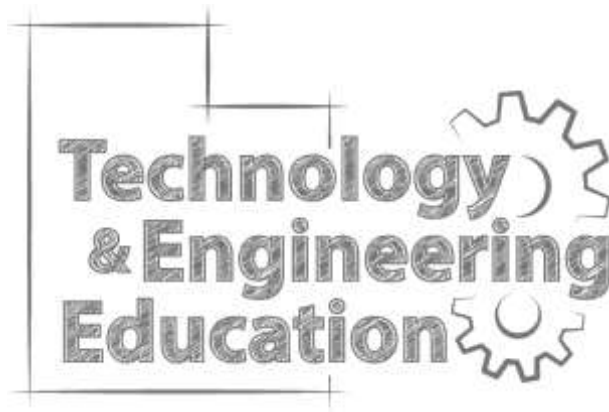


# Strands & Standards

## CAD ARCHITECTURAL DESIGN 1



### COURSE DESCRIPTION

The first in a sequence of courses that prepare individuals for careers in the Architecture, Engineering, and Construction (AEC) industry. This course includes instruction in 2D or 3D Computer-Aided Design (CAD) software to draw a small residential home with an emphasis on blueprint reading.

#### License Type

Secondary Education 6-12

#### Required Endorsement

Drafting (CAD),  
Engineering, or  
Technology & Engineering

Intended Grade Level: 10-12

Units of Credit: 0.5

Core Code: 38.01.00.00.041

CE Core Code: 38.01.00.13.041

Prerequisite: None

Skill Certification: 631

Test Weight: 0.5

# Strands & Standards

## STRAND 1 **Students will investigate Architecture, Engineering, and Construction (AEC) related career opportunities.**

- Standard 1** Identify related occupations within the AEC industry, their pay scales, and the requirements and qualifications to become such a professional.
- Standard 2** Identify personality types and potential AEC careers associated with those personalities.
- Standard 3** Differentiate between the responsibilities associated with different positions within the AEC industry.
- Standard 4** Investigate different forms of occupational training and educational opportunities for career opportunities in the AEC industry.

## STRAND 2 **Students will be able to understand, demonstrate, and apply mathematics and measuring skills.**

- Standard 1** Perform basic arithmetic functions using fractions and decimals.
  - Add
  - Subtract
  - Multiply
  - Divide
- Standard 2** Accurately and efficiently convert between fractions and decimals.
  - Decimal-Fraction conversion chart
- Standard 3** Convert between metric and imperial measurements.
- Standard 4** Demonstrate an ability to make and record basic measurements.
  - Use architect and civil engineer scales, measuring tapes, and other techniques to measure objects represented on paper.

## STRAND 3 **Students will be able to interpret and create construction documents used in the AEC industry.**

- Standard 1** Read and interpret residential home plans that include general notes, site, foundation, floor, elevation, floor and roof framing, electrical/ mechanical, cross and wall sections, stair details, and other typical plans.
- Standard 2** Identify the major milestones and tasks within the design, bid, and build process.
- Standard 3** Recognize which construction documents are used by various stakeholders of the construction team and identify when those documents are used throughout the design, bid, and build process.
- Standard 4** Read and interpret commercial plans that include civil, architectural, structural, electrical, and mechanical drawings.

## STRAND 4 **Students will be able to demonstrate sketching and CAD drawing techniques.**

- Standard 1** Demonstrate proper sketching techniques.
  - Create freehand sketches using paper, pencil, and an eraser (without the benefit of a straight edge, compass, or template) which is neat, clear, and smudge-free.

- Demonstrate the use of lines as they are drawn according to the alphabet of lines.
- Use letters and numerals that conform to an architectural style.
- Understand and demonstrate the use of perspective views.
- Understand and use accepted dimensioning practices for sketches.

**Standard 2** Demonstrate an ability to create CAD architectural drawings to a professional standard.

- Demonstrate proficiency at navigating a CAD software interface.
- Demonstrate exactness when producing drawing geometry creating elements which are accurate and drawn to scale.
- Use and know correct geometric construction techniques.
- Demonstrate the use of lines as they are drawn according to the alphabet of lines.
- Know and follow accepted architectural dimensioning standards to annotate drawings.
  - Understand and choose the best location for dimensions.
  - Demonstrate an ability to fully dimension the plan.
  - Demonstrate the correct use of leaders and notes using the correct text height and text style.
  - Understand the placement and use of title block information.
  - Understand the placement and use of general and specific notes.

## **STRAND 5** Students will be able to lay out a floor plan for a residence that meets Habitat for Humanity specifications for a two-bedroom, slab on grade, 20' x 40' starter home.

**Standard 1** Draw a floor plan using the accepted symbols and techniques in a clear and precise manner which complies with architectural standards.

- Demonstrate proper use of wall, room, door, and window types, common floor materials, and construction terminology.

**Standard 2** Draw all required elevation plans using the accepted symbols and techniques in a clear and precise manner which complies with architectural standards.

- Demonstrate proper use of elevation terminology to visualize and identify exterior building envelope materials.

**Standard 3** Draw a roof plan using the accepted symbols and techniques in a clear and precise manner which complies with architectural standards.

- Identify roof types, common roofing materials, and construction terminology.

## **STRAND 6** Student will be able to use construction documents to identify components and construct a scaled physical cross section model of a rambler with a basement using readily available materials.

**Standard 1** Identify and construct the components of the following building systems:

- Foundation – including footings, stem walls, slab, and porch cap
- Engineered Floor – including sill plate, floor joists, and sub-floor
- Exterior walls – including exterior & interior materials, and building envelope items such as insulation, doors, and windows
- Interior walls
- Stairs – including guardrail and handrail
- Roof – including energy truss, truss, and rafter

### Skill Certificate Test Points by Strand

Test Name	Test #	Number of Test Points by Strand						Total Points	Total Questions
		1	2	3	4	5	6		
CAD Architectural Design 1	631								

### Performance Objectives

<insert link>