# STRANDS AND STANDARDS
## CAD ARCHITECTURAL DESIGN 3



## Course Description

The third in a sequence of courses that prepare individuals for careers in the Architecture, Engineering, and Construction (AEC) industry. This course includes instruction in 3D Computer-Aided Design (CAD) software to model a small commercial building with an emphasis on commercial methods and materials of construction, codes, and Building Information Modeling (BIM).

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|---|---|
| **Core Code** | 38.01.00.00.043 |
| Concurrent Enrollment Core Code | 38.01.00.13.043 |
| Units of Credit | 0.5 |
| Intended Grade Level | 11-12 |
| Prerequisite | CAD Architectural Design 2 |
| Skill Certification Test Number | 633 |
| Test Weight | 0.5 |
| **License Type** | Secondary Education 6-12 |
| **Required Endorsement(s)** | T&E Drafting (CAD) |

## STRAND 1

**Students will discover how Building Information Modeling (BIM) is changing how buildings, infrastructure, and utilities are planned, designed, built, and managed.**

### Standard 1

Understand how BIM is an intelligent model-based process that provides insight to help you plan, design, construct, and manage buildings and infrastructure.

### Standard 2

Identify the business value of BIM.

### Standard 3

Identify how BIM helps reduce the risk of errors through integrated design, engineering, and fabrication workflows to minimize change orders.

### Standard 4

Identify how BIM helps streamline workflows, maintain more accurate information, and keep construction project moving forward more predictably.

## STRAND 2

**Students will identify the basic considerations in using the International Building Code (IBC).**

### Standard 1

Understand the history of codes, how codes are developed, the scope and limitations, and how to use the code.

### Standard 2

Understand a code versus a standard, code authority, permits, and inspections.

### Standard 3

Identify basic building occupancies based on their use and how that affects construction types, materials, and building size.

### Standard 4

Identify code requirements to provide adequate fire safety.
- Fire and smoke protection
- Passive fire protection (construction techniques)
- Active fire protection (sprinklers)

### Standard 5

Identify code requirements to provide life safety.
- Egress requirements to get people out
- Accessibility to get people in
- Building safety to protect people from falling

## Standard 6

Identify code requirements to provide health safety.
- Weather protection
- Interior Environment

## Standard 7

Insert indicator text.
- Structural Design
- Materials

# STRAND 3

**Student will be able to understand how accessibility codes and guidelines affect all new and some existing commercial construction projects.**

## Standard 1

Identify state and federal accessibility requirements of the following:
- International Building Code (IBC) A117.1-2003
- ADA 2010 Standards
- Federal Fair Housing Act's (FHA's) Accessibility Guidelines

# STRAND 4

**Students will be able to understand and demonstrate BIM techniques to create BIM architectural drawings to a professional standard.**

## Standard 1

Demonstrate proficiency completing the following concepts:
- Create a basic 2D family using imported content
- Create a parametric 3D family
- Create a custom annotation family
- Tagging elements
- Create a custom schedule using the tags
- Create a legend
- Create a basic profile for use in sweeps
- Create a custom profile family and apply it to a wall
- Create custom mullions and wall panels
- Create in place components
- Import CAD data to create a detail
- Detailing
- Custom detail components

# STRAND 5

**Students will model and document the remodel of an existing commercial building using "as-built" drawings.**

## Standard 1
Demonstrate proficiency completing the following concepts:
- Creating a title block
- Importing CAD information
- Modifying CAD information
- Creating a Site
- Use phasing to control existing vs. new construction
- Document demolition and new construction
- Place plumbing fixtures
- Customize curtain walls
- Provide stairs and circulation
- Add detail to the site using site elements
- Render the model

## Standard 2
Develop a full set of commercial architectural construction documents that include the following:
- Fully annotated sheets with dimensions, notes, tags, and schedules.
- Sheet set of typical architectural documentation needed for a commercial construction project.
  - Floor Plans & Section Views
  - Exterior & Interior Elevations
  - Ceiling Plans
  - Roof Plan
- Place site components such as trees, plants, people and other items to detail out the project model.

# Skill Certificate Test Points by Strand
Example table below. Refer to instructions for specifics.

| Test Name | Test # | Number of Test Points by Strand | | | | | Total Points | Total Questions |
|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | | |
| CAD Architectural Design 3 | 633 | 3 | 9 | 6 | 2 | 10 | 30 | 18 |

## Performance Skills

1. Create and maintain a portfolio of exemplary work.

2. Demonstrate practice of the *Technology & Engineering Professional Workplace Skills*. https://schools.utah.gov/cte/engineering/resources

3. Participate in a significant activity that provides each student with an opportunity to render service to others, employ leadership skills, or demonstrate skills they have learned through this course, preferably through participation in a Career & Technical Student Organization (CTSO) such as the Technology Student Association (TSA).