STRANDS AND STANDARDS
ARCHITECTURAL DESIGN 3

Learning that works for Utah
CTE®

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).

Intended Grade Level	11-12
Units of Credit	0.5
Core Code	38.01.00.00.043
Concurrent Enrollment Core Code	38.01.00.13.043
Prerequisite	Architectural Design 2
Skill Certification Test Number	633
Test Weight	0.5
License Area of Concentration	Secondary Education 6-12
Required Endorsement(s)	
Endorsement 1	Technology & Education (CTE/General)
Endorsement 2	CAD Architectural Design

STRAND 1

Structural Materials in Light Commercial Construction

Standard 1

Understand the use of Masonry

- CMU wall
- Tilt-up concrete
- Platform
- ICF Block

Standard 2

Understand the use of Steel

- Columns
- Beams
- Metal Studs

Standard 3

Understand the use of Wood

- SIP panels
- Wood stud framing
- Beams
  - Glulam
  - LVL
  - Micro lam

Standard 4

Understand the use of Glass

- Curtain walls
- Store fronts

Performance Skill

Student can identify different materials used in a building structure.

STRAND 2

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

Standard 1

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

Standard 2

Zoning

Standard 3

Identify code requirements to provide adequate fire safety.

- Fire and smoke protection
- Passive fire protection (construction techniques)
- Active fire protection (sprinklers)

Standard 4
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 5
Parking lot layout
- Required green space
- Useable space

Performance Skill
Student can create a design that considers and follows the IBC.

STRAND 3
ADA Requirements

Standard 1
Restrooms
- Handicap stall size
- Grab bars
- Sink clearance
- Insulated hot water lines

Standard 2
Traffic flow
- Entrances and exits
- Door swing access
  - Full swing

Standard 3
Public Service
- Countertop heights
- Accessibility

Performance Skill
Student can create a design that is ADA accessible.

STRAND 4
Light Commercial Design using BIM Software

Standard 1
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.
- Detailed, ADA compliant restrooms

Standard 2

Demonstrate proficiency completing the following concepts:

- Creating a title block
- Importing CAD information
- Modifying CAD information
- Creating a Site plan
- Place plumbing fixtures
- Customize curtain walls (if needed)
- Provide stairs and circulation
- Add detail to the site using site elements

Performance Skill

Student can create a complete set of drawings for a light commercial occupancy (such as business, educational, or mercantile) that fits within a 2 ft. cube at ¼" or ⅛" scale using BIM software.

STRAND 5

Professional Presentation of Model

Standard 1

Renderings

- Virtual
  - Static drawings
  - Walkthrough
- Hand drawn
- Slide deck

Standard 2

Physical Scale Concept Model

- 3D printing
- Foam core/chipboard/butter board
- CNC
  - Laser
  - Router

Performance Skill

Student can create and give a presentation on their light commercial building

Technology & Engineering Workplace Skills

- Exceed the established school attendance policy to establish a consisitent record of punctuality and dependability.
- Appropriately use personal electronic devices.
- Maintain a high standard of industrial hygiene by:
  - adopting strong habits of professional dress and personal hygiene,
  - wearing the appropriate personal protective equipment,
  - adopting the habit to "clean as you go", and
  - guarding against foreign object debris (FOD) from contaminating the workspace or product.

- Contribute to a culture of safety by:
  - understanding and complying with established safety procedures,
  - watching for and speaking out when potential hazards and concerns are observed, and
  - actively participating in improving safety conditions.
- Follow established practices and procedures with exactness.
- Work productively as a member of a team with awareness and respect of cultural differences.
- Exhibit initiative and leadership while demonstrating the ability to adapt to changing needs and situations.
- Communicate clearly & effectively with others.
- Proficiently use software found in the professional environment, such as MS PowerPoint, MS Excel, and MS Word.
- Correctly apply mathematics in areas such as:
  - addition, subtraction, multiplication, division,
  - fraction to decimal as well as decimal to fraction conversions, and
  - using decimal places.
- Understand mathematical concepts such as:
  - ratios and proportions,
  - rounding and tolerance ranges,
  - engineering notation, and
  - metric equivalents.
- Demonstrate an ability to solve problems and develop improvements to products and processes using critical thinking and creativity.
- Read and understand technical documents, such as work orders, specifications, and standard operating procedures.
- Complete assigned tasks in a timely manner and with a high degree of workmanship.