STRANDS AND STANDARDS
CAD ARCHITECTURAL DESIGN 2

Course Description
The second 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 design and model a small residential home with an emphasis on residential methods and materials of construction, codes, and Building Information Modeling (BIM).

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<tr>
<th>Core Code</th>
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<tr>
<td>Concurrent Enrollment Core Code</td>
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<td>Intended Grade Level</td>
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<tr>
<td>Prerequisite</td>
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<td>Skill Certification Test Number</td>
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<td>Test Weight</td>
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<td>License Type</td>
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<td>Required Endorsement(s)</td>
<td>T&amp;E Drafting (CAD)</td>
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STRAND 1
Students will be able to understand architectural design fundamentals.

Standard 1
Identify the historical influences that contributed to current home styles.
  • Recognize and describe the design elements of various architectural styles.
  • Discuss current trends in architecture.

Standard 2
List family needs that should be considered when planning a dwelling.

Standard 3
Discuss cost per type of construction, affordability, and the cost of amenities.
  • Discuss home construction costs using the cost per square foot.

Standard 4
Discuss accessibility requirements for good functional utility.

STRAND 2
Students will be able to understand room and space planning.

Standard 1
Discuss factors that are important in the design of the following rooms or areas:
  • Living Room
  • Great/Family Room
  • Entry/Foyer
  • Porch
  • Patio or Deck
  • Bedroom
  • Kitchen
  • Bathroom
  • Storage
  • Garage
  • Laundry

Standard 2
Identify the areas or zones of a residential floor plan and the code implications.
  • Habitable
  • Non-Habitable
  • Public
  • Private
  • Living
  • Sleeping
  • Service or work Areas
• Storage and utility

**Standard 3**
Understand basic regulations concerning home design and construction.

- Discuss International Residential Code (IRC) implications for a residence.
- Discuss FHA minimum standards for a residence.
- Discuss local zoning restrictions for a residence.

**STRAND 3**
Students will identify the basic considerations in using the International Residential Code (IRC).

**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 code requirements relating to site development.

**Standard 4**
Identify code requirements to provide structural safety.

- Structural Design Criteria
- Foundations
- Framing

**Standard 5**
Identify code requirement relating to interior and exterior finishes as well as weather protection.

**Standard 6**
Identify code requirements to provide health and safety.

- Home safety
- Fire safety
- Healthy living environment
- Chimneys and Fireplaces

**Standard 7**
Identify code requirements relating to utilities and energy usage.

- Electrical
- HVAC
- Plumbing
- Energy efficiency
STRAND 4
Modeling (BIM) techniques to create BIM architectural drawings to a professional standard.

Standard 1
Demonstrate proficiency completing the following concepts:
- Navigating the BIM software interface
- Creating and using the different views and how they are navigated
- Adjusting views through view ranges and line styles
- Defining visibility/ graphics overrides and object styles
- Starting a new project and creating levels and grids to reference
- Creating walls and adjusting their settings
- Understanding wall types and the structure of walls
- Modifying elements
- Placing components such as doors, windows, and components
- Creating floors, ceilings, and roofs
- Creating curtain walls
- Creating stairs
- Using model groups
- Adjusting Visual Properties
- Creating room elements such as tags, fill plans, and schedules
- Using a title block family to create sheets

STRAND 5
Students will create a complete set of plans for a rambler style residence, with a basement, while maintaining less than 1000 square feet on the main floor.

Standard 1
Provide for all the essential elements of a living structure while optimizing the use of space within the prescribed footprint.

Standard 2
Draw a complete set of construction documents using the accepted symbols and techniques in a clear and precise manner which complies with architectural standards and includes the following:
- Cover Sheet
- General Notes
- Site or Plot Plan
- Foundation Plan
- Basement Plan
- Main Floor Plan
- Floor Framing Plan
- Roof Plan
- Cross Section
• Typical Wall Section
• Stair Detail Plan
• Electrical/HVAC Plan

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

<table>
<thead>
<tr>
<th>Test Name</th>
<th>Test #</th>
<th>Number of Test Points by Strand</th>
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<td>CAD Architectural Design 2</td>
<td>632</td>
<td>5</td>
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**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/tech/publicationsresources](https://schools.utah.gov/cte/tech/publicationsresources)

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).