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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<th>Core Code</th>
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<td>Intended Grade Level</td>
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<td>Prerequisite</td>
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<td>Skill Certification Test Number</td>
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<td>Required Endorsement(s)</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
CAD Architectural Design 2

- 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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Performance Skills

1. Create and maintain a portfolio of exemplary work.


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).