EXAM INFORMATION

Exam Number
632

Items
55

Points
59

Prerequisites
CAD Architectural Design I

Recommended Course Length
One semester

National Career Cluster
Architecture & Construction Science, Technology, Engineering & Mathematics

Performance Standards
Included (Optional)

Certificate Available
Yes

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).

EXAM BLUEPRINT

<table>
<thead>
<tr>
<th>STANDARD</th>
<th>PERCENTAGE OF EXAM</th>
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</thead>
<tbody>
<tr>
<td>1- Architectural Design Fundamentals</td>
<td>9%</td>
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<tr>
<td>2- Room &amp; Space Planning</td>
<td>17%</td>
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<tr>
<td>3- International Residential Code (IRC)</td>
<td>20%</td>
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<tr>
<td>4- Building Information Modeling (BIM)</td>
<td>15%</td>
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<tr>
<td>5- Create Plans</td>
<td>39%</td>
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</tbody>
</table>
STANDARD 1
STUDENTS WILL BE ABLE TO UNDERSTAND ARCHITECTURAL DESIGN FUNDAMENTALS.

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

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

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

Objective 4  Discuss accessibility requirements for good functional utility.

STANDARD 2
STUDENTS WILL BE ABLE TO UNDERSTAND ROOM AND SPACE PLANNING.

Objective 1  Discuss factors that are important in the design of the following rooms or areas:
1. Living Room
2. Great/Family Room
3. Entry/Foyer
4. Porch
5. Patio or Deck
6. Bedroom
7. Kitchen
8. Bathroom
9. Storage
10. Garage
11. Laundry

Objective 2  Identify the areas or zones of a residential floor plan and the code implications.
1. Habitable
2. Non-Habitable
3. Public
4. Private
5. Living
6. Sleeping
7. Service or work Areas
8. Storage and utility

Objective 3  Understand basic regulations concerning home design and construction.
1. Discuss International Residential Code (IRC) implications for a residence.
2. Discuss FHA minimum standards for a residence.
3. Discuss local zoning restrictions for a residence.
STANDARD 3
STUDENTS WILL IDENTIFY THE BASIC CONSIDERATIONS IN USING THE INTERNATIONAL RESIDENTIAL CODE (IRC).

Objective 1
Understand the history of codes, how codes are developed, the scope and limitations, and how to use the code.

Objective 2
Understand a code versus a standard, code authority, permits, and inspections.

Objective 3
Identify code requirements relating to site development.

Objective 4
Identify code requirements to provide structural safety.
   1. Structural Design Criteria
   2. Foundations
   3. Framing

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

Objective 6
Identify code requirements to provide health and safety.
   1. Home safety
   2. Fire safety
   3. Healthy living environment
   4. Chimneys and Fireplaces

Objective 7
Identify code requirements relating to utilities and energy usage.
   1. Electrical
   2. HVAC
   3. Plumbing
   4. Energy efficiency

STANDARD 4
STUDENTS WILL BE ABLE TO UNDERSTAND AND DEMONSTRATE BUILDING INFORMATION MODELING (BIM) TECHNIQUES TO CREATE BIM ARCHITECTURAL DRAWINGS TO A PROFESSIONAL STANDARD.

Objective 1
Demonstrate proficiency completing the following concepts:
   1. Navigating the BIM software interface
   2. Creating and using the different views and how they are navigated
   3. Adjusting views through view ranges and line styles
   4. Defining visibility/ graphics overrides and object styles
   5. Starting a new project and creating levels and grids to reference
   6. Creating walls and adjusting their settings
   7. Understanding wall types and the structure of walls
   8. Modifying elements
   9. Placing components such as doors, windows, and components
   10. Creating floors, ceilings, and roofs
   11. Creating curtain walls
   12. Creating stairs
   13. Using model groups
15. Creating room elements such as tags, fill plans, and schedules
16. Using a title block family to create sheets

STANDARD 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.

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

Objective 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:

1. Cover Sheet
2. General Notes
3. Site or Plot Plan
4. Foundation Plan
5. Basement Plan
6. Main Floor Plan
7. Floor Framing Plan
8. Roof Plan
9. Cross Section
10. Typical Wall Section
11. Stair Detail Plan
12. Electrical/HVAC Plan
CAD Architectural Design II Performance Standards (Optional)

Performance assessments may be completed and evaluated at any time during the course. The following performance skills are to be used in connection with the associated standards and exam. To pass the performance standard the student must attain a performance standard average of 8 or higher on the rating scale. Students may be encouraged to repeat the objectives until they average 8 or higher.

Students Name_________________________________________________________________

Class_________________________________________________________________________

PERFORMANCE STANDARD I

□ Create and maintain a portfolio of exemplary work.

PERFORMANCE STANDARD 2

□ Demonstrate professional workplace skills, such as:
  o Correctly apply mathematics in areas such as:
    • Addition, subtraction, multiplication, division
    • Fraction to decimal as well as decimal to fraction conversions
    • Using decimal places
  o Understand mathematical concepts such as:
    • Ratios and proportions
    • Rounding and tolerance ranges
    • Engineering notation
    • Metric equivalents
  o Demonstrate an ability to think critically and creatively to solve problems and develop improvements to products and processes.
  o Read and understand technical documents, such as work orders, specifications, and standard operating procedures.
  o Complete assigned tasks in a timely manner and with a high degree of workmanship.
  o Work productively as a member of a team with an awareness of and respect for global diversity and cultural differences.

PERFORMANCE STANDARD 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).

PERFORMANCE Rating Scale

0 Limited Skills 2 4 Moderate Skills 6 8 High Skills 10
PERFORMANCE STANDARD AVERAGE SCORE:

Evaluator Name _________________________________________________

Evaluator Title ________________________________________________

Evaluator Signature ____________________________________________

Date __________________________________________________________