Architectural Design 3

Exam Information

Exam number
633

Items
22

Points
41

Prerequisites
Architecture Design 1 & 2

Recommended course length
One semester

National Career Cluster
Architecture & Construction

Science, Technology, Engineering, & Mathematics

Performance standards
Included (Optional)

Certificate available
Yes

Description

The Architectural Design 3 industry certification exam assesses proficiency in 3D Computer-Aided Design (CAD) software for modeling a small commercial building. The exam focuses on commercial methods and materials of construction, building codes, and Building Information Modeling (BIM). It is designed for learners preparing for careers in the Architecture, Engineering, and Construction (AEC) industry.

Exam Blueprint

Standard	Percentage of exam
1. Structural materials in commercial construction	15%
2. International Building Code (IBC)	22%
3. ADA Requirements	15%
4. Light commercial design using BIM	37%
5. Professional presentation of model	12%

Standard 1

Structural Materials in Light Commercial Construction

Objective 1 Understand the use of Masonry

1. CMU wall
2. Tilt-up concrete
3. Platform
4. ICF Block

Objective 2 Understand the use of Steel

1. Columns
2. Beams
3. Metal Studs

Objective 3 Understand the use of Wood

1. SIP panels
2. Wood stud framing
3. Beams
    a. Glulam
    a. LVL
    b. Micro lam

Objective 4 Understand the use of Glass

1. Curtain walls
2. Store fronts

Standard 1 Performance Evaluation included below (Optional)

Standard 2

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

Objective 1 Identify basic building occupancies based on their use and how that affects construction types, materials, and building size.

Objective 2 Zoning

Objective 3 Identify code requirements to provide adequate fire safety.

1. Fire and smoke protection
2. Passive fire protection (construction techniques)
3. Active fire protection (sprinklers)

Objective 4 Identify code requirements to provide life safety.

1. Egress requirements to get people out
2. Accessibility to get people in
3. Building safety to protect people from falling

Objective 5 Parking lot layout

1. Required green space
2. Useable space

Standard 2 Performance Evaluation included below (Optional)

Standard 3

ADA Requirements

Objective 1 Restrooms

1. Handicap stall size
2. Grab bars
3. Sink clearance
4. Insulated hot water lines

Objective 2 Traffic flow

1. Entrances and exits
2. Door swing access
    a. Full swing

Objective 3 Public Service

1. Countertop heights
2. Accessibility

Standard 3 Performance Evaluation included below (Optional)

Standard 4

Light Commercial Design using BIM Software

Objective 1

Develop a full set of commercial architectural construction documents that include the following:

1. Fully annotated sheets with dimensions, notes, tags, and schedules.
2. Sheet set of typical architectural documentation needed for a commercial construction project.
3. Floor Plans & Section Views
4. Exterior & Interior Elevations
5. Ceiling Plans
6. Roof Plan
7. Place site components such as trees, plants, people and other items to detail out the project model.
8. Detailed, ADA compliant restrooms

Objective 2

Demonstrate proficiency completing the following concepts:

1. Creating a title block
2. Importing CAD information
3. Modifying CAD information
4. Creating a Site plan
5. Place plumbing fixtures
6. Customize curtain walls (if needed)
7. Provide stairs and circulation
8. Add detail to the site using site elements

Standard 5

Professional Presentation of Model

Objective 1

Renderings

1. Virtual
    a. Static drawings
    b. Walkthrough
2. Hand drawn
3. Slide deck

Objective 2

Physical Scale Concept Model

1. 3D printing
2. Foam core/chipboard/butter board
3. CNC
    a. Laser

b. Router

Architectural Design 3

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.

Student's Name: _____

Class: _____

Performance standards rating scale

0	Limited skills	2	→	4	Moderate skills	6	→	8	High skills	10

Standard 1 – Structural materials in commercial construction Score:

- Student can identify different materials used in a building structure.

Standard 2 – International Building Code (IBC) Score:

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

Standard 3 – ADA Requirements Score:

- Student can create a design that is ADA accessible.

Standard 4 – Light commercial design using BIM

- 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.

Standard 5 – Professional presentation of model Score:

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

Technology & engineering workplace skills Score:

- Exceed the established school attendance policy to establish a consistent record of punctuality and dependability.
- Appropriately use (or not 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 an awareness of and respect for global diversity and cultural differences.
- Exhibit initiative and leadership while maintaining a flexible and adaptable attitude.
- 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 think critically and creatively to solve problems and develop improvements to products and processes.
- 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.

Performance standard average score:

Evaluator Name: _____

Evaluator Title: _____

Evaluator Signature: _____

Date: _____