



CAD Architectural Design II

EXAM INFORMATION

Items

55

Points

59

Prerequisites

CAD ARCHITECTURAL DESIGN I

Grade Level

10-12

Course Length

ONE SEMESTER

Career Cluster

ARCHITECTURE AND CONSTRUCTION
SCIENCE, TECHNOLOGY, ENGINEERING
AND MATHEMATICS

Performance Standards

NOT INCLUDED

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

STANDARD

PERCENTAGE OF EXAM

1- Architectural Design Fundamentals	9%
2- Room & Space Planning	17%
3- International Residential Code (IRC)	20%
4- Building Information Modeling (BIM)	15%
5- Create Plans	39%



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



14. Adjusting Visual Properties
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