



Design Technology Architectural Design 1

This is the first instructional course in a sequence of courses that prepares individuals with knowledge of residential architectural and related construction. This course includes instruction in architectural blueprint reading, sketching, residential floor plans, exterior elevations, and use of CAD software.

**Utah State Office of Education
Career & Technical Education**

ARCHITECTURAL DESIGN 1

Levels:	Grades 10-12
Units of Credit:	Minimum 0.5
CIP Code:	15.1302
11 Digit Code:	40-10-00-00-001
11 Digit DE Code:	40-10-00-13-001
Test #:	542
License:	CTE/Secondary
Endorsement:	Design Technology
Prerequisite:	None

COURSE DESCRIPTION

This is the first instructional course in a sequence of courses that prepares individuals with knowledge of residential architectural and related construction. This course includes instruction in architectural blueprint reading, sketching, residential floor plans, exterior elevations, and use of CAD software.

Instructors should be cautioned to limit the size of the dwelling to 1,100 square feet on the main floor.

STANDARD 1

Students will be able to understand, demonstrate, and apply mathematics and measuring skills.

Objective 1 Demonstrate, and apply related mathematics.

- a. Perform basic arithmetic functions.
 - Add, subtract, multiply, and divide whole numbers.
 - Add, subtract, multiply, and divide fractions.
 - Add, subtract, multiply, and divide decimals.
- b. Convert fractions/decimals.
 - Convert fractions to decimal equivalents.
 - Convert decimal values to nearest fractional equivalent.

Objective 2 Demonstrate an ability to make and record basic measurements.

- a. Use scales, measuring tapes, and other techniques to take measurements.
- b. Make and use measurements using fraction, foot-inch, and decimal-foot scales.
- c. Record measurements using Cartesian and polar coordinates, as well as absolute and relative distances.

STANDARD 2

Students will be able to understand and demonstrate drawing techniques.

Objective 1 Demonstrate proper sketching techniques.

- a. Create freehand sketches using paper, pencil, and an eraser (without the benefit of a straight edge, compass, or template) which is neat, clear, and smudge-free.
- b. Understand and demonstrate the use of the alphabet of lines.
Demonstrate the use of lines as they are drawn according to the alphabet of lines.
- c. Produce a one-view sketch of an object using proportional relationships.
- d. Use letters and numerals that conform to an architectural style.
- e. Demonstrate how words and letters are to be evenly spaced.
- f. Understand and demonstrate the use of perspective views.
- g. Understand and use accepted dimensioning practices for sketches.

Objective 2 Demonstrate an ability to create architectural drawings to a professional standard.

- a. Demonstrate exactness when producing drawing geometry.
- b. Drawing elements are accurate and drawn to scale.
- c. Use and know correct geometric construction techniques.
- d. Construct lines as defined by the alphabet of lines.
- e. Understand and correctly use object, hidden, and center lines.
- f. Understand and correctly use dimension lines, extension lines and, leader lines.
- g. Identify border lines, phantom lines, and section lines and know their uses.
- h. Know and follow accepted architectural dimensioning standards to apply the appropriate dimensions to drawings.
 - Understand and choose the best location for dimensions.
 - Apply appropriate spacing between the object and the first dimension.
 - Apply uniform spacing between dimension lines.
 - Demonstrate an ability to fully dimension the object.
 - Demonstrate the correct use of leaders and notes.
 - Use appropriate angles for leaders.
 - Use appropriate leader line terminators.

Objective 3 Apply the appropriate notes to drawings.

- a. Understand the placement and use of title block information.
- b. Understand the placement and use of general notes.
- c. Use the correct text height.
- d. Use architectural style letters and numerals.

STANDARD 3

Students will develop and demonstrate an ability to use computer software to create architectural drawings.

Objective 1 Know how to save, open, rename, and move data files using common computer operating system software.

Objective 2 Originate architectural drawings using 2D or 3D computer-aided design software features.

- a. Create a new drawing setup to support architectural standards.
- b. Create drawing setups for different sizes of drawing formats.

Objective 3 Revise existing architectural drawings using 2D or 3D computer-aided design software features.

Objective 4 Produce hardcopies of drawings using correct printer/plotter settings.

- a. Print/Plot drawings using the appropriate scale settings.
- b. Print/Plot drawings with correct line widths.

STANDARD 4

Students will be able to understand architectural design fundamentals.

Objective 1 Identify the historical influences that contributed to current home styles.

Objective 2 Recognize and describe the design elements of contemporary dwellings.

Objective 3 Discuss current trends in architecture.

Objective 4 List family needs that should be considered when planning a dwelling.

Objective 5 Discuss accessibility requirements for good functional utility.

STANDARD 5

Students will be able to understand and apply architectural room planning for the sleeping, living, and service areas.

Objective 1 Discuss factors important in the design of bedrooms, bathrooms, and closets. Apply those design elements to sketches and drawings.

Objective 2 Discuss factors important in the design of family rooms, living rooms, entryways, foyers, porches, and courts. Apply those design elements to sketches and drawings.

Objective 3 Discuss factors important in the design of kitchens, clothes care centers, and garages. Apply those design elements to sketches and drawings.

Objective 4 Discuss home construction costs using the cost per square foot. Discuss cost per type of construction, affordability, and the cost of amenities.

STANDARD 6

Students will be able to understand how to layout a residential floor plan.

Objective 1 Draw a residential floor plan using the accepted symbols and techniques.

Objective 2 List the information required on a typical floor plan.

Objective 3 Represent typical materials using standard architectural symbols.

Objective 4 Draw the dimensions of a floor plan in a clear and precise manner which complies with architectural standards.

Objective 5 Recognize the difference between a good and poor drawing of a floor plan.

STANDARD 7

Students will be able to understand how to analyze, calculate, and design footings and foundations.

Objective 1 List the major considerations when designing a footing for a residential foundation.

Objective 2 Analyze a typical floor plan to determine the appropriate foundation.

STANDARD 8

Students will be able to understand how to layout exterior elevations.

Objective 1 List features that should be included on an exterior elevation.

Objective 2 Identify the dimensions commonly shown on elevations.

Objective 3 Illustrate symbols that are often found on elevations.

Objective 4 Draw a typical exterior elevation which demonstrates proper techniques.

STANDARD 9

Students will be able to understand how to layout wall construction.

Objective 1 Name the components of a typical frame wall.

Objective 2 Draw and label a typical wall section and full cross sections.

STANDARD 10

Students will be able to understand how to complete a door and window schedules.

Objective 1 Draw a window schedule that would include window size, make, material, and type of glazing.

Objective 2 Draw a door schedule that would include door size, style, type of lockset, special features, and jamb size.

STANDARD 11

Students will gain an understanding of Design Technology as a profession and will develop professional skills for the workplace.

Objective 1 As a participating member of the SkillsUSA student organization completes the SkillsUSA Level 1 Professional Development Program.

- a. Complete a self-assessment inventory and identify individual learning styles.
- b. Discover self-motivation techniques and establish short-term goals.
- c. Determine individual time-management skills.
- d. Define future occupations.
- e. Define awareness of cultural diversity and equity issues.
- f. Recognize the benefits of conducting a community service project.
- g. Demonstrate effective communication skills with others.
- h. Participate in a shadowing activity.
- i. Identify components of an employment portfolio.
- j. Explore what is ethical in the workplace or school.
- k. Demonstrate proficiency in program competencies.
- l. Explore what is ethical in the workplace or school.
 - State the SkillsUSA motto.
 - State the SkillsUSA creed.
 - Learn the SkillsUSA colors.
 - Describe the official SkillsUSA dress.

- Describe the procedure for becoming a SkillsUSA officer.

Objective 2 Understand the use of drawings in architectural design and how those drawings relate to career opportunities.

Objective 3 Display a professional attitude toward the instructor and peers.