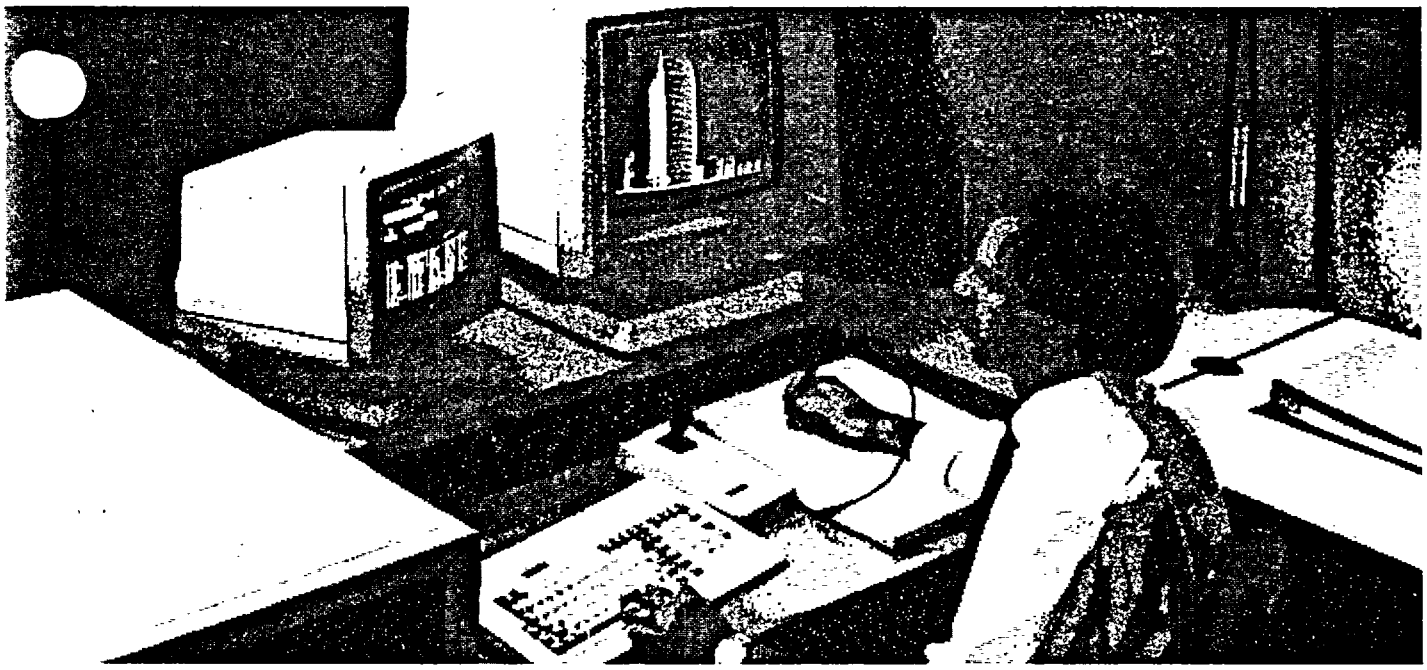
TECHNOLOGY EDUCATION
ARCHITECTURAL DRAWING

GRADES 9-12
ELECTIVE



The University of the State of New York
The State Education Department
Bureau of Home Economics
and Technology Education Programs
Division of Occupational Education
Albany, New York 12234

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USE IN SEQUENCE: **Elective course**

This course is one of the New York State approved electives in Technology Education. It is one of several electives courses designed to give students a firm but broad exploration of the technical world in which they live.

Students completing a high school sequence in Technology Education must take a total of 1-3 units of elective course work to fulfill the "elective" portion of their sequence requirement. This course may also be taken by any student as an elective. If the instructor uses this syllabus as a guide for instruction, students may be granted Regents credit for the experience.

Several courses within Technology Education offerings can be offered on a 1/2-unit or 1-unit basis. Course work earning 1/2-unit must comprise a minimum of 54 hours of instruction and course work earning 1-unit must comprise a minimum of 108 hours of instructional time.

Students with Disabilities

The Board of Regents, through the part 100 Regulations of the Commissioner, the Action Plan, and The Compact for Learning, has made a strong commitment to integrating the education of students with disabilities into the total school program. According to Section 100.2(s) of the Regulations of the Commissioner of Education, "Each student with a handicapping condition as such term is defined in Section 200.1(ii) of this Chapter, shall have access to the full range of programs and services set forth in this Part to the extent that such programs and services are appropriate to such student's special educational needs." Districts must have policies and procedures in place to make sure that students with disabilities have equal opportunities to access diploma credits, courses, and requirements.

The majority of students with disabilities have the intellectual potential to master the curricula content requirements for a high school diploma. Most students who require special education attend regular education classes in conjunction with specialized instruction and/or related services. These students must attain the same academic standards as their nondisabled peers to meet graduation requirements, and, therefore, must receive instruction in the same content areas, at all grade levels. This will ensure that they have the same informational base necessary to pass statewide testing programs and meet diploma requirements.

Teachers certified in the subject area should become aware of the needs of students with disabilities who are participating in their classes. Instructional techniques and materials must be modified to the extent appropriate to provide students with disabilities the opportunity to meet diploma requirements. Information or assistance is available through special education teachers, administrators, the Committee on Special Education (CSE) or student's Individualized Education Program (IEP).

Strategies for Modifying Instructional Techniques and Materials

1. Students with disabilities may use alternative testing techniques. The needed testing modification must be identified in the student's Individualized Education Program (IEP). Both special and regular education teachers need to work in close cooperation so that the testing modifications can be used consistently throughout the student's program.

2. Identify, define and pre-teach key vocabulary. Many terms in this syllabus are specific and some students with disabilities will need continuous reinforcement to learn them. It would be helpful to provide a list of these key words to the special education teacher in order to provide additional reinforcement in the special educational setting.

3. Assign a partner for the duration of a unit to a student as an additional resource to facilitate clarification of daily assignments, timelines for assignments, and access to daily class notes.

4. When assigning long-term projects or reports, provide a timeline with benchmarks as indicators for completion of major sections. Students who have difficulty with organizational skills and time sequence may need to see completion of sections to maintain the organization of a lengthy project or report.

Infusing Awareness of Persons with Disabilities Through Curriculum

In keeping with the concept of integration, the following subgoal of the Action plan was established.

<u>In all subject areas, revisions in the syllabi will include materials and activities related to</u> generic subgoals such as problem solving, reasoning skills, speaking, capacity to search for information, the use of libraries and increasing student awareness of and <u>information about the disabled.</u>

The purpose of this subgoal is to ensure that appropriate activities and materials are available to increase student awareness of disabilities.

This curriculum, by design, includes information, activities, and materials regarding persons with disabilities. Teachers are encouraged to include other examples as may be appropriate to their classroom or the situation at hand.

STUDENT LEADERSHIP SKILLS

Development of leadership skills is an integral Part of occupational education in New York State. The New York State Education Department states that, "Each education agency should provide to every student the opportunity to participate in student leadership development activities. All occupational education students should be provided the opportunity to participate in the educational activities of the student organization(s) which most directly relate(s) to their chosen educational program."

Leadership skills should be incorporated in the New York State occupational education curricula to assist students to become better citizens with positive qualities and attitudes. Each individual should develop skills in communications, decision making/problem solving, human relations, management, and motivational techniques.

Leadership skills may be incorporated into the curricula as competencies (Performance Objectives) to be developed by every student or included within the Suggested Instructional Strategies. Teachers providing instruction through occupational educational curricula should familiarize themselves with the competencies. Assistance may be requested from the State advisor of the occupational student organization related to the program area.

Students who elect to become active members of one of the student leadership organizations chartered by the New York State Education Department have the advantage of the practical forum to practice leadership skills in an action oriented format and have the potential for recognition of their achievements at the local, State, and national level.

Course Overview

As humans began staying in fixed locations for longer periods of time, the planning and construction of shelters has become more important. The modern architect still works with form and function of buildings for human habitation. To the cumulative knowledge of design from the past, they added engineering developments, new building materials and building methods. Today's architectural designer wears many hats: a structural engineer, a designer, system engineer, an artist, and communicator. The method of communication is a visual language: architectural drafting. The Architectural Drawing curse will explore the most common types of drawings that are used in communicating the design idea and constructing the final structure. This course is planned to develop an understanding of the principles of design, and the skills needed to produce quality drawings that communicate the design clearly, for presentation and construction.

The recent development of computer technology has had a major impact in the architectural designer's work environment. Rapidly replacing drafting boards, t-squares, and pens and pencils, computer aided design and drafting has released the designer to explore building methods and design concepts that would have been impractical in the past. Architects can quickly change a design to meet clients' wishes and easily show the client what effect the change will have with an image the client will easily understand. Although sketching skills are still the best method to develop free flowing design ideas without the structure that CAD requires, the mundane practices of drawing of proper weight, lines, lettering, and drawing title blocks are best completed by CAD. Large libraries of standard symbols and details built into a CAD system, along with the ease of producing most required plans from a single floor plan, speed up the design process an cut costs.

Our laboratories must reflect the changes in the professional architectural work environment. Students should have the opportunity to learn the skills required for CAD.

However, at this point of time in the transition from traditional drawing methods to CAD, the pragmatic situation is that not all architectural offices utilize CAD exclusively. Even some colleges do not have adequate CAD equipment or allow all drafting to be accomplished with computers. Therefore, at this time, it appears that it is still necessary or desirable for students to have at least some experience with traditional drafting tools, techniques and methods. Some students might subsequently be at a disadvantage if they found themselves in a situation without CAD or where they required hand drawing skills.

This revision of the syllabus still contains extensive reference to traditional drafting. Additional CAD content has been added. With the total amount of content suggested in the syllabus, the teacher will need to devise appropriate instructional strategies to save time and keep within the framework of time allocated for the modules comprising the course. Depending on the number of CAD work stations available in the laboratory the

technology teacher will need to make careful judgements regarding the depth of instruction and class time devoted to CAD and/or traditional drafting, and the relative proficiency expected of students in each drafting technique.

The one half unit course is divided into four modules. The are:

Introduction to Architectural Drawing
Planning and Drawing
Architectural Drawing Techniques
Career Exploration

COURSE: **ARCHITECTURAL DRAWING**
MODULE: **INTRODUCTION TO ARCHITECTURAL DRAWING**

CONTENT OUTLINE

Estimated Teaching Time - 9 hours

I. *Culture and History*

A. **The Monumental Civilizations**
1. Egypt - mass structures
2. Middle Eastern civilizations

B. **Greek Architecture (Classical Period)**
1. Post and lintel design
2. Column orders (Doric, Ionic, Corinthian)

C. **Roman Architecture**
1. Column orders (Composite, Tuscan)
2. Arch
3. Vault
4. Dome

D. **Early Christian and Byzantine Architecture**
1. Basilicon churches
2. Centralized structure

E. **Gothic Architecture (1100-1500)**
1. Early Gothic (pointed arch, buttress, flying buttress)
2. High Gothic
3. Late Gothic

F. **The Renaissance (1420-1770)**
1. Europe
2. England

G. **The Twentieth Century**
1. Technological advances
2. New construction methods and materials
3. Contemporary architects
4. Specialized building, skyscrapers, residential buildings, town planning

CONTENT OUTLINE, continued

II. *Tools and Techniques*

A. **Architectural Scales**
1. Significance
2. Reduced scale 1/4 and 1/8
3. Shape, divisions, types
4. Use and care

B. **Drafting Instruments and Equipment**
1. T-squares/triangles/adjustable triangles
2. Drafting machines
3. Compass/dividers/flexible curves
4. Technical inking pens (esp. Rapidograph)
5. Erasing shield

C. **Drawing Papers**
1. Tracing vellum
2. Papers for rough copy and overlay designs
3. Diazo prints

D. **Drawing Pencils**
1. Hardness identification standards
2. Mechanical lead holders
3. Wood pencils
4. 0.5 mm pencils

E. **Computerized Drafting and Design Systems**
1. Types of computer-aided drafting equipment
2. Ways computer-aided drafting is used
3. Architectural floor plan/detailing
4. Schedule generation from architectural plans using CADD
5. 3-D floor plans for generating elevation plans, sections and other details.

CONTENT OUTLINE, continued

F. **Timesavers**
   1. General purpose templates (esp. Timely #T-35)
   2. Roof pitch gauge/stair guides/area nomograph
   3. Four inch triangles for detailed areas/closets
   4. Overlays/underlays/grids (title block master)
   5. Ames type guideliner for brick and siding
   6. Type set lettering, wax lettering/symbols
   7. Cadd symbol libraries

G. **Architectural Drawing Techniques**
   1. Line character/quality
   2. Line technique/silhouette emphasis/major feature/distance technique
   3. Symbols

H. **Sketching as an Aid to Design**

III. *Lettering*

A. **Purposes of Lettering**

B. **Spacing Letters and Words**
   1. Use of optical spacing
   2. Special letters: A, X, I, H

C. **Use of Guidelines**
   1. Guidelines for words/proportion to drawing
   2. Various heights used for words
   3. Guidelines for numbers and fractions

D. **Types of Pencils (H, 2H, 3H)**

E. **Basic Styles of Lettering**
   1. Condensed
   2. Expanded
   3. Slanted

COURSE: ARCHITECTURAL DRAWING

CONTENT OUTLINE, continued

F. **Lettering Forms**
   1. Gothic
   2. Old Roman
   3. Architectural style
   4. Pressure sensitive
   5. Microfont
   6. Templates

C. **Border and Title Block**
   1. Margin sizes for border line
   2. Location of title block and information
      a. owner's name and address
      b. type of structure
      c. architect's name and address
      d. title of sheet and sheet number
      e. date
      f. scale
      g. initials of detailing drafter and supervisor

IV. *Aesthetics*

A. **Elements of Design**
   1. Lines and their purpose
      a. straight
      b. curved
      c. vertical
      d. horizontal
   2. Form and its purpose
      a. rectangles
      b. squares
      c. geometric shapes
   3. Color and its purpose
      a. color harmonies
      b. hue
      c. value
      d. tint
      e. shade
      f. intensity

COURSE: ARCHITECTURAL DRAWING

CONTENT OUTLINE, continued

4. Light and shadow
    a. reflection vs. absorption
    b. intensity
5. Space
    a. defining space
    b. space relationships
6. Materials
    a. Textures that create various moods
    b. rough vs. smooth

B. **Principles of Design**
1. Balance
    a. formal vs. informal
    b. symmetrical and asymmetrical
2. Emphasis/subordination
    a. dominations vs. subordination
    b. use of elements of design
    c. focal point
3. Proportion
    a. pleasing ratio dimension (2:3, 3:5, 5:8)
    b. interior space harmonious with its accessories
4. Unity/repetition
    a. wholeness of any or all of the elements of design
    b. use of consistent line and color
    c. repetition to tie structure together aesthetically
5. Variety/opposition
    a. aesthetic value and interest
    b. contrasting elements
6. Transition

C. **Creativity**
1. Definition of creativity
2. Definition of imagination

D. **Functional Design**
1. Purpose of functional design
2. Form follows function concept
3. Relation to environment

COURSE: ARCHITECTURAL DRAWING

CONTENT OUTLINE, continued

E. **Design Process**
   1. Basic idea to final design
   2. Principles and elements of design used without sacrificing function

V. ***Environmental Factors***

A. **Energy Planning and Orientation**
   1. Purpose
   2. Passive solar systems
      a. collectors
      b. storage facilities
      c. distribution channels
      d. controls
      e. southern exposure
      f. thermal mass
      g. vent and window placement
   3. Active solar planning - collector designs
   4. Environmental and construction planning
      a. overhang protection (summer/winter)
      b. vegetation
      c. building materials
      d. ceiling design
      e. building location and placement (orientation)
      f. earth sheltered homes
      g. room location for morning and nighttime hours
   5. "Organic" integration of structure and land form (as per Frank Lloyd Wright)

B. **Density Planning**
   1. Purpose
   2. Redevelopment
      a. short term
      b. long range
   3. Neighborhood planning
      a. community
      b. regions
      c. future planning/expected rate of growth

CONTENT OUTLINE, continued

C. **Ecological Planning**
   1. Land pollution
   2. Air pollution
   3. Water pollution
   4. Visual pollution
   5. Sounds levels

D. **Internal Building Environmental Factors**
   1. Radon gas
   2. Air pollution from building materials

MODULE: PLANNING AND DRAWING Estimated Teaching Time - 15 hours

CONTENT OUTLINE, continued

I. ***Site Plan***

A. **Building Orientation**
   1. Terrain (outline and elevation)
   2. Structures nearby
   3. Prevailing wind direction
   4. Angle of sun (latitude of site)
   5. Areas of water
   6. Existing landscaping/desired landscaping
   7. Prominent physical features
   8. Local building code requirements (setback)
   9. Open space considerations
   10. Total lot area
   11. Security considerations

B. **Landscaping**
   1. Types of vegetation for climate
   2. Location of vegetation
   3. Shade and windbreak conditions
   4. Privacy and security requirements
   5. Concealment (e.g., shrubs for foundation)
   6. Define areas of property
   7. Control of foot traffic

COURSE: ARCHITECTURAL DRAWING

CONTENT OUTLINE, continued

C. **Lines, Symbols, and Conventions**
   1. Utilities
   2. Structures
   3. Landscaping
   4. Features (fence, contour, boundary)

II. *Area/Room Plan*

A. **Tailoring Areas to the Client**
   1. Financial resources
   2. Building style preferred
   3. Number of people who will occupy house
   4. Special interests/hobbies
   5. Number of cars
   6. Preference for open or closed type plan
   7. Unusual furniture requirements
   8. Accessibility/accommodation for Handicapped

B. **Living, or Public, Area**
   1. Square footage desired
   2. Halls
   3. Dining room
   4. Living room
   5. Study, den, or library
   6. Family or recreation room
   7. Porch or patio
   8. Guest lavatory

C. **Sleeping, or Private, Area**
   1. Bedroom
   2. Lavatory

D. **Utility, or Work, Areas**
   1. Kitchen
   2. Garage or carport
   3. Utility room
   4. Workshop
   5. Storage

CONTENT OUTLINE, continued

E. **Traffic Pattern**
   1. Anticipated flow of people
   2. Hallways
   3. Stairs
   4. Entrances

III. *Floor Plan*

A. **Drawing Floor Plans**
   1. Importance as most common architectural drawing
   2. Perspective
   3. Information provided
   4. Use for other drawings

B. **Types of Floor Plan Drawings**
   1. Simple sketches
   2. Completely dimensioned, detailed plans
   3. Single-line drawing
   4. Abbreviated floor plan
   5. Pictorial floor plan
   6. Ink presentation plan
   7. Cadd modeling

C. **Floor Plan Symbols**
   1. Doors and windows
   2. Stairs
   3. Appliances and fixtures
   4. Sanitation facilities
   5. Building materials
   6. Regional variations

D. **Steps in Drawing Floor Plans**
   1. Block in overall dimensions
   2. Add thickness of outside walls
   3. Lay out inside walls positions
   4. Locate doors and windows by their centers
   5. Darken object lines
   6. Add door and window symbols
   7. Add stairs

CONTENT OUTLINE, continued

8. Erase extraneous lines
9. Outline kitchen and bathroom fixtures
10. Add masonry work and fireplaces
11. Dimension the drawing

E. **Second Floor Plan**
1. Trace major outline of first floor
2. Remove first floor plan
3. Note alignment of stairwell, plumbing walls, and chimneys

F. **Size Description**
1. Complete dimensions
2. Limited Dimensions

G. **Dimensioning Accuracy**
1. Importance
2. Cost of errors in time, efficiency, and money

H. **Dimensioning Floor Plans**
1. Always give feet and inches
2. Dimensions read from bottom or right of drawing
3. Use foot and/or inch marks
4. Avoid bisecting a room or area in the center with a dimension line
5. Avoid duplicating wall thickness when placing dimension lines
6. Indicate main entrance with a significant arrow

I. **Module Construction**
1. Designed within module limits
2. Standard Sizes
3. Saves time, labor, and materials
4. Standard grid
5. Grid dimensions/non-grid dimensions

J. **Floor plan Timesavers**
1. 1/4 scale template
2. Stair guides
3. Four inch triangles for small areas/closets
4. Underlay title block master

CONTENT OUTLINE, continued

5. Ames type guideliner for lettering
6. 0.5 mm pencils
7. Erasing shields
8. Diazo prints

K. **Computer-Aided Drafting and Design Systems (CADD)**
1. CADD as a developmental tool
2. CADD as a time saver
3. Architectural floor plan/detailing
4. Developing elevations from floor plans
5. Developing wall sections from floor plans
6. Developing pictorials from floor plans

L. **Drawing Techniques for Floor Plans**
1. Line contrast/density
2. Organize dimensions
3. Dimensioning style/technique
4. Lettering style/technique
5. Symbols
6. Sketching as an aid to designing/redesigning areas
7. Overlays as an aid to designing/redesigning areas

MODULE: ARCHITECTURAL DRAWING TECHNIQUES

Estimated Teaching Time - 27 hours

I. *Dimensioning*

A. **Types of Dimension Plan**
1. Floor plan
2. Elevation plan
3. Section plan
4. House framing plan
5. Roof framing plan

B. **Floor Plans**
1. Purpose of dimensions
2. Complete dimensions
3. Limited dimensions
4. Rules for floor plan dimensioning

CONTENT OUTLINE, continued

5. Rules of the American National Standard Drafting Manual

C. **Elevation Plans**
1. Difference from floor plan
2. Datum line
3. Rules for dimensioning above and below datum line
4. Basic standards and rules for elevation drawings

D. **Section Plans**
1. Purposes
2. Differences from elevation and floor plans
3. Rules for dimensioning section plans
4. Details

E. **House Framing Plans**
1. Purpose
2. Difference from a section plan
3. Control dimensions

F. **Roof Framing Plans**
1. Purpose
2. Difference from section and house framing plans
3. Rules for dimensioning roof framing plans

II. *Sections/Framing*

A. **Purpose of Sections/Framing Drawing**

B. **Architectural Symbols**
1. Purpose/types
2. Material symbols
3. Door symbols
4. Window symbols

C. **Types of Foundations**
1. Purpose
2. Slab foundation
3. T-foundation
4. Advantages and disadvantages

COURSE: ARCHITECTURAL DRAWING

CONTENT OUTLINE, continued

D. **Floor Framing Plans**
   1. Types of plans
      a. single line floor framing
      b. double line floor framing
   2. Size of materials and positions
      a. girder
      b. sill
      c. sole plate
      d. joists
      e. sub-flooring
      f. header

E. **Wall Framing Plans**
   1. Purpose and identification
   2. Size of materials and position
      a. stud
      b. corner
      c. lintel
      d. trimmer
      e. sill
      f. sole plate
      g. cut in brace
      h. let in brace
      i. top plate

F. **Wall Framing Plans**
   1. Purpose and identification
   2. Types of roofs
      a. gable roof
      b. hip roof
      c. other
   3. Size of materials and position
      a. rafter
      b. ridgeboard
   4. Roof detail elements
      a. span
      b. run

CONTENT OUTLINE, continued

c. rise
d. slope

G. **Stair Plans and Placement**
1. Purpose and identification
2. Types of stairwell plans
3. Materials and suggested material sizes
   a. tread width
   b. riser width
   c. headroom clearance
   d. stairwell openings
   e. landings
   f. banister heights
4. Using formulas to calculate total run

III. *Exterior Elevations*

A. **Elevation Design**
1. Purpose
2. Relationship with floor plan

B. **Fundamental Shapes**
1. Types of structures: one story, one and one half story, two story, split level, bilevel
2. Roof styles: gable, hip, flat, shed, other

C. **Factors Affecting Appearance**
1. Balance
2. Texture
3. Color
4. Patterns
5. Relationship between surfaces, doors, windows, and chimneys

D. **Elevation Drawing**
1. Projection from floor plan
2. Determining heights
3. Determining roof pitch
4. Symbols
5. Dimensioning

COURSE: ARCHITECTURAL DRAWING

CONTENT OUTLINE, continued

IV. *Perspectives*

A. **Exteriors**

1. Isometric drawings
2. Perspective drawings (vanishing point, horizontal line)
3. One-point perspective
4. Two-point perspective
5. Vertical placement
6. Drawing a simple two-point perspective
7. Projecting a two-point perspective

B. **Interiors**

1. One-point perspective
2. Two-point perspective
3. Interior pictorial grids

C. **Rendering**

1. Media
2. Shade
3. Shadow
4. Texture
5. Sequence
6. Techniques
7. Perspective composition

D. **Architectural Models**

1. Three-dimensional aspects
2. Model construction
3. CADD modeling

E. **Perspective Timesavers**

1. Perspective drawing board
2. Perspective grids

F. **Drawing Techniques for Perspectives**

1. Line contrast/accent/accuracy
2. Symbols
3. Sketching as an aid to design

COURSE: ARCHITECTURAL DRAWING

CONTENT OUTLINE, continued

G. **Computer-Aided Drafting and Design Systems (CADD) for Architectural Applications**
   1. Floor Plan
      a. Space diagram
      b. Automatic wall generation
      c. Automatic window and door insertion
      d. Symbol generation from standard library
   2. Automatic generation of other plans from CADD floor plan
      a. Elevation
      b. Sections
      c. Roof plans
   3. Presentation
      a. 3-D modeling
      b. Perspective, isometric, shading and rendering

MODULE: CAREER EXPLORATION

Estimated Teaching Time - 3 hours

A. **Careers in Architectural Drawing**
   1. Career categories
   2. Job description (tracer, detailer, architect, etc.)
   3. Job availability
   4. Job benefits
   5. Opportunities for advancement and job security
   6. Education and training requirements for job entry

B. **Careers in Fields Related to Architectural Drawing**
   1. Career Categories
   2. Job descriptions (technical illustrator, engineer, teacher, architect, etc.)
   3. Job availability
   4. Job benefits
   5. Opportunities for advancement and job security
   6. Education and training requirements for job entry

Total Teaching Time : 54 hours

COURSE: **ARCHITECTURAL DRAWING**
MODULE: **INTRODUCTION TO ARCHITECTURAL DRAWING**

Estimated Teaching Time - 9 hours

TOPICS: ***Culture and History***
Tools and Techniques
Lettering
Aesthetics
Environmental Factors

COURSE: ARCHITECTURAL DRAWING
MODULE: INTRODUCTION TO ARCHITECTURAL DRAWING

OVERVIEW OF MODULE

Goal

Architectural design had its beginnings when people constructed the first primitive lean-to shelters. As structures became more complex, detailed drawings were needed. This module covers the historical background of architectural design and the basic skills and understandings necessary to produce accurate drawings. Upon completion, students will understand cultural influences on architecture; know how to use architectural tools and techniques to complete architectural drawings; be able to produce a neat and personalized style of architectural lettering; be capable of drawing architectural forms which are functional and aesthetically pleasing; and understand the relationship of environmental factors to architectural design.

Description

This module is divided into five topics: ***Culture and History, Tools and Techniques, Lettering, Aesthetics,*** and ***Environmental Factors.***

Applied mathematics and career exploration should be infused as applicable.

Skills, Knowledge, and Behaviors to be Developed

The ability to:

1. Trace the history of architectural design.
2. Explain how cultural heritage contributes to the development of the architectural art form.
3. Use basic instruments and equipment of architectural drawing, including scales, pencils, papers, and precision drawing instruments.
4. Describe how computerized drafting and design systems (CAD) are used for architectural applications.
5. Use timesavers to sketch and construct architectural drawings in an efficient manner.
6. Employ a lettering style and spacing technique.
7. Develop a border and title block.
8. Understand and implement elements and principles of design in architectural drawings.

SKILLS, KNOWLEDGE, AND BEHAVIORS TO BE DEVELOPED, continued

9. Incorporate energy planning, density planning, and ecological considerations in architectural drawings.
10. Sketch simple drawings.

COURSE: **ARCHITECTURAL DRAWING**
MODULE: **INTRODUCTION TO ARCHITECTURAL DRAWING**
TOPIC: **Culture and History**

PERFORMANCE OBJECTIVES/SUPPORTING COMPETENCIES

1. Given an overview of the history of architectural design, the student will describe aspects of this history pertinent to modern architecture.

   In order to do this, the student must be able to:

   a. Explain how knowledge gained from past centuries is used when designing a building today.
   b. Explain how the history of architectural design is directly related to progress in other areas, such as advancements in mathematics and science.
   c. Describe differences in the various Greek and Roman column orders.
   d. Trace the historical development of architectural structural design.
   e. Give historical examples of the two basic architectural structures which are still in use today (bearing wall and skeleton frame).

2. Given a presentation and overview of the cultural aspects and implications upon architectural design, the student will describe the origin, influence, and relationship of architectural design and local or regional culture.

   In order to do this, the student must be able to:

   a. Identify various architectural design styles.
   b. Explain how the local or regional culture influence architectural design.
   c. Identify the architectural designs which exist in the community and explain how those designs are influenced by various cultural heritages.
   d. Locate those structures which are exemplary of architectural design as a cultural resource.

COURSE: **ARCHITECTURAL DRAWING**
MODULE: **INTRODUCTION TO ARCHITECTURAL DRAWING**
TOPIC: **Culture and History**

SUGGESTED INSTRUCTIONAL STRATEGIES

1. Show slides/filmstrips/movies on historical and present-day architectural design.

2. Take a field trip around town, stopping at and discussing various examples of architectural design.

3. Show a slide series which illustrates important developments and structures in the history of architecture.

4. Have students research one period in the history of architecture with emphasis on its cultural influences. Have students report to the class on their research.

5. Discuss the cultural influences of some buildings in the community.

COURSE: **ARCHITECTURAL DRAWING**
MODULE: **INTRODUCTION TO ARCHITECTURAL DRAWING**
TOPIC: **Tools and Techniques**

PERFORMANCE OBJECTIVES/SUPPORTING COMPETENCIES

1. Given assigned readings and instruction, the student will name and describe the tools and techniques used for architectural drawing.

   In order to do this, the student must be able to:

   a. Explain the significance of the architectural scale.
   b. Name and describe the use and care of selected items of drawing equipment used by the architectural draftsperson.
   c. List three types of architectural drawing papers and their uses.
   d. Explain how diazo or equivalent prints are made and used.
   e. Identify the characteristics and use of specialized drafting machines and technical pens.

2. Given an introduction, instruction, and sample problems, the student will use the tools/equipment and materials of architectural drawing correctly to produce lines and symbols suitable for architectural drawings.

   In order to do this, the student must be able to:

   a. Use two different architectural scales.
   b. Select, sharpen, and use pencils appropriate for the type of line being created.
   c. Use lead-holders and 0.5 mm automatic pencils.
   d. Keep drawings clean.
   e. Use basic drafting equipment.
   f. Use the T-square and triangles and/or CAD system to construct an architectural drawing.
   g. Use different types of architectural drawing papers.
   h. Make and use duplicate prints and plotted drawings.
   i. Use drawing instruments to produce drafting techniques suitable for architectural drawings and to complete assignments.
   j. Use time-efficient methods ("timesavers") or symbol libraries in the preparation of architectural drawings.

COURSE: **ARCHITECUTRAL DRAWING**
MODULE: **INTRODUCTION TO ARCHITECTURAL DRAWING**
TOPIC: **Tools and Techniques**

PERFORMANCE OBJECTIVES/SUPPORTING COMPETENCIES, continued

3. Given a presentation on architectural drawing in the world of work, the student will describe characteristics of this world and use CADD in architectural drawing.

   In order to do this, the student must be able to:

   a. Describe five characteristics of the architectural draftsperson's world of work.
   b. Explain how a computerized drafting system (CADD) is used for architectural applications.
   c. Use CADD to generate an architectural drawing.
   d. Explain how CAD systems save time and reduce errors over traditional methods.

COURSE: **ARCHITECTURAL DRAWING**
MODULE: **INTRODUCTION TO ARCHITECTURAL DRAWING**
TOPIC: **Tools and Techniques**

SUGGESTED INSTRUCTIONAL STRATEGIES

1. Have students practice using applied mathematics in drawings, focusing especially on 1/4 scale.

2. Provide visual examples/displays of work done by professionals and former students illustrating both good and bad technique.

3. Demonstrate proper and safe set-up, use and storage of equipment and proper architectural line construction techniques.

4. Invite guest speakers from engineering, drafting, architecture, college, and technical education fields.

5. Show films/slides/video cassettes on architectural drawing techniques, use of scales, and careers in architectural drawing.

6. Take field trips to: local community colleges, civil engineering firms, light or heavy industry, architectural firms, and or town planning boards.

7. Assign problems in the use of T-square, triangles, and timesavers and/or CAD system

8. Have students make prints or plots.

9. Assign drawings which demonstrate architectural line character quality and technique.

10. Have students sketch architectural designs and ideas. Encourage creativity through choice of assignments.

11. Conduct a drawing performance test.

12. Use continuing evaluation procedures which reinforce and improve student's architectural drawing performance.

SUGGESTED INSTRUCTIONAL STRATEGIES,continued

13. Suggest several methods to keep architectural drawings free of smudges.

14. Explain the difference between:
    - lettering guide and lettering stencil
    - dividers and proportional dividers
    - adjustable and fixed T-square
    - adjustable and 45 degree triangle
    - two bevel scales and triangular scale
    - ruling pen and technical pen

15. Display students' drawing in school and the community.

16. Have students set up and use CADD to generate a simple drawing.

17. Have students develop and share "symbols" for use in a CADD system.

COURSE: **ARCHITECTURAL DRAWING**
MODULE: **INTRODUCTION TO ARCHITECTURAL DRAWING**
TOPIC: **Lettering**

PERFORMANCE OBJECTIVES/SUPPORTING COMPETENCIES

1. Given a review on preparing a plate and Gothic single stroke mechanical style lettering plus presentations and related reading assignments, the student will describe a standard title block and any architectural notes required for a typical drawing assignment.

   In order to do this, the student must be able to:

   a. Describe the purposes of lettering for an architectural drawing.
   b. Identify the various styles of lettering which are used on architectural drawings.
   c. Describe the methods of spacing letters and words.
   d. Describe the lettering techniques used for keeping letters, numbers, and fractions a uniform height in proportion to the drawing.
   e. Relate the methods for setting a proper border for the drawing.
   f. Identify the elements required to be placed into a title block.

2. Given a presentation on architectural lettering and related assignments, the student will develop and employ a suitable style of lettering, and use letter devices to complete a title block and standard notation.

   In order to do this, the student must be able to:

   a. Develop an architectural lettering style derived from basic lettering styles.
   b. Implement the technique of optimum spacing of letters and words.
   c. Use guidelines for keeping letters, numbers, and fractions a uniform height in proportion to the drawing.
   d. Develop a border and title block.
   e. Implement the necessary elements which are represented in a title block in architectural drawing.
   f. Use specialized lettering forms such as pressure sensitive, lettering templates, and microfont lettering.

COURSE: **ARCHITECTURAL DRAWING**
MODULE: **INTRODUCTION TO ARCHITECTURAL DRAWING**
TOPIC: **Lettering**

SUGGESTED INSTRUCTIONAL STRATEGIES

1. Provide various lettering specimens from which students can practice.

2. Display samples of specific architectural lettering styles.

3. Have students "square a plate" and divide it into four equal quadrants. Draw guidelines spaced at 1/8 inch in the upper two quadrants, 3/16 inch in the lower left, and 1/4 inch in the lower right quadrant. Allow students to practice lettering various styles until they achieve a style with which they are comfortable.

4. Encourage students to letter using different drawing pencils (2H, H, F, HB).

5. Have students develop guidelines by using lettering guide underlays and/or the Ames Lettering Guide template.

6. Practice lettering with wax transfer or type set letters.

COURSE: **ARCHITECTURAL DRAWING**
MODULE: **INTRODUCTION TO ARCHITECTURAL DRAWING**
TOPIC: **Aesthetics**

PERFORMANCE OBJECTIVES/SUPPORTING COMPETENCIES

1. Given presentations, related assignments, and sample problems related to aesthetic design factors, the student will explain several major aspects of design.

   In order to do this, the student must be able to:

   a. Describe informal and formal design.
   b. Describe creative design vs. functionalism.
   c. Identify and describe the elements of design.

2. Given presentations, related assignments, and sample problems, the student will relate the principles of design to aesthetically functionally buildings.

   In order to do this, the student must be able to:

   a. Define the purpose of balance.
   b. Differentiate between buildings which are formal and informally balance.
   c. Identify and describe the principles of rhythm, emphasis, proportion, unity, variety, repetition, opposition, subordination, and transition.
   d. Apply creativity and imaginative thought processes in developing new patterns, objects, and configurations.

SUGGESTED INSTRUCTIONAL STRATEGIES

1. Have students develop exterior sketches of commercial buildings and homes utilizing the elements and principles of design. Encourage creativity through choice of assignments.

2. Provide multi-media films and slide presentations of architecture that is aesthetically pleasing.

COURSE: **ARCHITECTURAL DRAWING**
MODULE: **INTRODUCTION TO ARCHITECTURAL DRAWING**
TOPIC: **Environmental Factors**

PERFORMANCE OBJECTIVES/SUPPORTING COMPETENCIES

1. Given presentations, related assignments, and sample problems, the student will implement information about passive and active solar systems in a drawing and/or written plan.

   In order to do this, the student must be able to:

   a. Describe passive solar systems.
   b. Identify storage facilities for passive solar systems.
   c. Explain the "greenhouse effect" created by window placement on a southern exposure.
   d. Describe proper vent and window placement for solar cooling techniques.
   e. Make a drawing showing storage facilities for a passive solar system.
   f. Describe an active solar system.
   g. Explain the thermal principles involved in an active system.
   h. Describe the mechanical principles involved in an active system.
   i. Develop a detail plan for an active system.

2. Given presentations, related assignments, and sample problems, the student will implement a design for protection against heat loss and heat gain caused by nature's elements.

   In order to do this, the student must be able to:

   a. Describe overhang protection and its use in summer and winter.
   b. Describe the use of vegetation to favor or protect against natural elements.
   c. Identify building materials used as energy saving aids.
   d. Select a location which can shelter a home from nature's elements.
   e. Implement baffles, natural or human-made, on the landscape design.
   f. Position the house to reduce wind effects.
   g. List advantages and disadvantages in developing an earth-sheltered home.

COURSE: **ARCHITECTURAL DRAWING**
MODULE: **INTRODUCTION TO ARCHITECTURAL DRAWING**
TOPIC: **Environmental Factors**

PERFORMANCE OBJECTIVES/SUPPORTING COMPETENCIES, continued

3. Given presentations, related assignments, and specifications for a problem the student will apply building codes and energy considerations in the design and placement of a structure.

   In order to do this, the student must be able to:

   a. Describe the purpose of orientation.
   b. Design a house within building codes on a given lot.
   c. Use energy efficient room location placement.
   d. Describe and implement "organic" integration of structure and land form.

4. Given presentations, related assignments, and specifications for a problem, the student will utilize information about density planning in the design of a given neighborhood (or community/region).

   In order to do this, the student must be able to:

   a. Define average density.
   b. Design and plan a given area using effective density patterns for the best possible use of land.
   c. Describe the various terms of redevelopment and their purposes.
   d. Describe neighborhood planning.
   e. Identify and make a plan for growth in relation to neighborhood, community, and regions.

5. Given presentations, related assignments, and a scenario, the student will apply information about external, ecological, and in internal invironmental planning factors to avoid common pollution related problems.

   In order to do this, the student must be able to:

   a. Describe the purpose of ecological planning.
   b. Identify various forms of pollution and guard against them through ecological planning.
   c. Identify possible forms of pollution from building materials.

MODULE: **INTRODUCTION TO ARCHITECTURAL DRAWING**
COURSE: **ARCHITECTURAL DRAWING**
TOPIC: **Environmental Factors**

SUGGESTED INSTRUCTIONAL STRATEGIES

1. Have students develop detail elevation drawings of residential homes that use passive solar hearing and cooling. Use continuing evaluation procedures which reinforce and improve students' drawings.

2. Have students develop a plan utilizing orientation of a building to its environment.

3. Have students redesign a square mile area around their home to provide density balance.

4. Have students perform an energy audit on their home and develop a plan to reduce energy consumption.

COURSE: **ARCHITECTURAL DRAWING**
MODULE: **PLANNING DRAWINGS**

Estimated Teaching Time - 15 hours

TOPICS: ***Site Plan***
Area/Room Plans
Floor Plan

MODULE: **PLANNING DRAWINGS**
COURSE: **ARCHITECTURAL DRAWING**
MODULE: **Planning Drawings**

OVERVIEW OF MODULE

Goal

In this model, students will acquire the knowledge and skills to produce site (or plot) drawings, using the symbols and conventions of actual practice. They will design and draw rooms and areas as part of an architectural plan. Finally, they will gain experience in drawing floor plans, the most common and informative type of architectural drawing.

Description

This module is divided into three topics: ***Site Plan, Area/Room Plan,*** and ***Floor Plan.*** Emphasis is placed on using standard conventions and relevant symbols.

Skills, Knowledge, and Behaviors to be Developed

The ability to:

1. Explain the factors that influence location of a structure on a site.
2. Describe considerations relevant to landscaping of a site.
3. Use standard lines, symbols, and lettering in drawing architectural plans.
4. Incorporate theory and practice when planning public, private, and work areas/rooms.
5. Describe the types and uses of architectural floor plans.
6. Draw first floor plan and derive second floor plan from it.

COURSE: **ARCHITECTURAL DRAWING**
MODULE: **PLANNING DRAWINGS**
TOPIC: **Site Plan**

PERFORMANCE OBJECTIVES/SUPPORTING COMPETENCIES

1. Following instruction and discussion, the student will explain the logic used to determine a structure's site orientation and appropriate landscaping for that site.

   In order to do this, the student must be able to:

   a. Explain basic concerns with respect to building orientation.
   b. Describe basic elements of landscaping.

2. Given instruction and specifications, the student will draw a site plan to those specifications.

   In order to do this, the student must be able to:

   a. Understand written/oral descriptions of common building site specifications.
   b. Use instruments to sketch and/or draw a site plan.
   c. Demonstrate familiarity with standard line and symbol conventions as used in site plans.

COURSE: **ARCHITECTURAL DRAWING**
MODULE: **PLANNING DRAWINGS**
TOPIC: **Site Plan**

SUGGESTED INSTRUCTIONAL STRATEGIES

1. Visit a business in which site plans are designed or used.

2. Have a speaker make a presentation concerning site drawings as an architect, landscaper, or surveyor.

3. Display and discuss commercial plot drawings.

4. Compare or have a judging of several student site drawing solutions to the same problem.

5. Develop quizzes concerning a sample site drawing.

6. Have each student to do a site drawing of his/her own home as it is and as he or she wishes it might be.

7. Have students draw a site plan for the school.

COURSE: **ARCHITECTURAL DRAWING**
MODULE: **PLANNING DRAWINGS**
TOPIC: **Area/Room Plans**

PERFORMANCE OBJECTIVES/SUPPORTING COMPETENCIES

1. Following instruction, the student will devise a practical solution to an area/room design problem and sketch/draw this solution.

   In order to do this, the student must be able to:

   a. Understand oral and written architectural descriptions of various housing elements.
   b. Use information such as fiscal limitations, client's wishes, traffic patterns, and site orientation to form a practical plan.
   c. Sketch/draw a solution on paper at desired scale.

SUGGESTED INSTRUCTIONAL STRATEGIES

1. Visit a business which deals with the architectural concerns of area and room designing.

2. Have an architect, architectural drafter, or interior designer make a presentation concerning area/room design.

3. Display commercial/professional design solutions for common housing situations.

4. Fabricate a group of furniture templates suitable for use in arranging a floor layout for student use of for instructor use on an overhead projector.

5. Have students categorize, label, and draw the public, private, and work areas of their own homes.

6. Assign an area/room planning problem to the class and discuss the merits of the different solutions.

7. Using a CAD system, develop 3 different solutions of an area/room planning problem and discuss the merits of each.

COURSE: **ARCHITECTURAL DRAWING**
MODULE: **PLANNING DRAWINGS**
TOPIC: **Floor Plan**

PERFORMANCE OBJECTIVES/SUPPORTING COMPETENCIES

1. Given assigned readings and instruction, the student will describe the purpose and types of floor plans and the symbol used in them.

   In order to do this, the student must be able to:

   a. Explain the significance of architectural floor plans.
   b. Name and describe the floor plan symbols used by the architectural draftsperson.
   c. List three alternate types of architectural floor plans and their uses.
   d. Explain the differences between regular and module floor plans.
   e. Identify the characteristics and use of specialized floor plan dimensioning and the importance of accuracy.
   f. Explain how to draw the second floor plan once the first floor has been drawn.

2. Given an introduction, instruction, and sample problems the student will use tools/equipment and materials to produce lines and symbols suitable for architectural drawings.

   In order to do this, the student will:

   a. Use all basic architectural floor plan symbols.
   b. Select and use dimensioning techniques characteristic of a floor plan.
   c. Use lead-holders and 0.5 mm automatic pencils.
   d. Construct an architectural floor plan in an efficient manner.
   e. Use vellums in the preparation of an architectural floor plan drawing.
   f. Make a diazo or equivalent print of the floor plan.
   g. Use drawing instruments to produce drafting techniques suitable for architectural floor plan drawings.
   h. Use several time-efficient items suitable for the preparation of architectural floor plans.
   i. Use CADD for floor plan detailing.

COURSE: **ARCHITECTURAL DRAWING**
MODULE: **PLANNING DRAWINGS**
TOPIC: **Floor Plan**

SUGGESTED INSTRUCTIONAL STRATEGIES

1. Have students practice using applied mathematics, especially focusing on 1/4 scale floor plan drawings.

2. Provide visual examples/displays of work done by professionals and/or former students, illustrating both good and bad technique. Use this strategy with discretion so as to have a positive effect on student motivation.

3. Invite guest speakers from engineering, drafting, architecture, college, technical education fields, and former students.

4. Show films/slides/video cassettes on architectural drawing techniques, use of floor plans, and careers in architectural drawing.

5. Conduct a field trip to any of the following: local community colleges, civil engineering firms, light or heavy industry, architectural firms, or town planning boards.

6. Assign floor plans to be drawn, encouraging creativity through choice of assignment.

7. Have students complete a floor plan according to own original design.

8. Have students draw a complete floor plan from a sketch provided, identifying symbols and using a technical pen in the completion of the drawing.

9. Have students make diazo prints of floor plans.

10. Conduct a drawing performance test.

11. Use continuing evaluation procedures which reinforce and improve student's architectural drawing performance.

12. Display/exhibit in school and in local forums student drawings.

13. Have students develop a floor plan to a "client's" specification. Students should demonstrate the use of layers and symbol libraries.

SUGGESTED INSTRUCTIONAL STRATEGIES, continued

14. Have students use 3-D modeling to show what a room in a floor plan would look like.

15. Have students develop a video presentation of a floor plan for a client.

COURSE: **ARCHITECTURAL DRAWING**
MODULE: **ARCHITECTURAL DRAWING TECHNIQUES**

Estimated Teaching Time - 27 hours

TOPICS: *Dimensioning*
Sections/Framing
Exterior Elevations
Perspectives

COURSE: **ARCHITECTURAL DRAWING**
MODULE: **ARCHITECTURAL DRAWING TECHNIQUES**

OVERVIEW OF MODULE

Goal

In this module, students will increase and improve their architectural drawing skills and gain a greater comprehension of architectural design and construction through dimensioning of elevations, sections, house, and roof frame plans. Students will also complete a previously drawn floor plan.

Description

Four topics comprise this module: ***Dimensioning, Sections/Framing, Exterior Elevations,*** and ***Perspectives.*** Dimensioning rules that apply to various types of architectural plans will be covered, and students will become familiar with the section and framing plans used in architecture and construction. Through lessons, discussion, and practice, students will increase their knowledge of architectural style, exterior appearance and materials, balance, texture, and design.

Skills, Knowledge, and Behaviors to be Developed

The ability to:

1. Explain the need for dimensioning architectural plans.
2. Use specific rules for dimensioning floor and elevation plans.
3. Use specific rules and methods for dimensioning architectural sections and house and roof framing plans.
4. Describe the purpose of sections and framing in architectural drawings.
5. Identify and use material, window, and door symbols.
6. Dimension sectional views.
7. Describe basic types of residential structures and roof styles.
8. Project an elevation drawing from a floor plan.
9. Define a pleasing elevation as depending on the relationship of surface materials, and textures, doors windows, roof lines, and chimneys and formal/informal balance.
10. Explain how perspective drawings can be derived from a floor plan and produced on CAD systems.
11. Construct perspective architectural drawings in a time-efficient manner using aids and techniques specifically designed for perspective drawings.

COURSE: **ARCHITECTURAL DRAWING**
MODULE: **ARCHITECTURAL DRAWING TECHNIQUES**

SKILLS, KNOWLEDGE, AND BEHAVIORS TO BE DEVELOPED, continued

12. Use precision drawing instruments to achieve line emphasis and line quality.
13. Demonstrate familiarity with renderings and such items as media, shade, shadow, texture, and color.

COURSE: **ARCHITECTURAL DRAWING**
MODULE: **ARCHITECTURAL DRAWING TECHNIQUES**
TOPIC: **Dimensioning**

PERFORMANCE OBJECTIVES/SUPPORTING COMPETENCIES

1. Given an introduction, instruction, and sample problem the student will dimension an architectural floor plan to specifications.

   In order to do this, the student must be able to:

   a. Define terms that apply to architectural floor plan dimensioning.
   b. State the rules for dimensioning floor plans.
   c. Adhere to the rules of floor plan dimensioning as stated by the American National Standard Drafting Manual.
   d. Dimension a floor plan.

2. Given an introduction, instruction, and sample problems the student will dimension an architectural elevation plan to specifications.

   In order to do this, the student must be able to:

   a. Define terms that apply to elevation dimensioning.
   b. Establish the location of a datum line on an elevation drawing.
   c. Add the elevation dimensions to an elevation drawing.

3. Given an introduction, instruction, and sample problem solutions, the student will dimension architectural sections, house framing elevations, and roof frame plans to specifications.

   In order to do this, the student must be able to:

   a. Identify the need for and differences among section, house framing, and roof framing plans.
   b. Utilize architectural dimensioning rules to detail a section drawing.
   c. Apply architectural dimensions to house and roof framing plans by showing the size and spacing of framing members and dimensions between major framing components.

COURSE: **ARCHITECTURAL DRAWING**
MODULE: **ARCHITECTURAL DRAWING TECHNIQUES**
TOPIC: **Dimensioning**

SUGGESTED INSTRUCTIONAL STRATEGIES

1. Hand out an incomplete sample floor plan and have students add all missing dimensions.

2. Have students dimension a floor plan that they have previously drawn.

3. Invite an architect as a guest speaker to discuss the importance of dimensioning and the careers associated with it.

4. Present a series of transparencies with overlays that add the required dimensions to a plan.

5. Give students a handout with the important dimensioning symbols.

6. On a CAD system, give the students a floor plan with the correct dimension layer turned off. Have the students dimension the floor plan and them compare that to the correct layer.

COURSE: **ARCHITECTURAL DRAWING**
MODULE: **ARCHITECTURAL DRAWING TECHNIQUES**
TOPIC: **Sections/Framing**

PERFORMANCE OBJECTIVES/SUPPORTING COMPETENCIES

1. Given presentations, related assignments, and questions to answer, the student will reference and interpret common architectural symbols.

   In order to do this, the student must be able to:

   a. Define architectural symbols.
   b. Describe the purpose of the symbols.
   c. Identify the various material symbols in floor plans and elevation views.
   d. Identify the various window and door symbols found on a floor plan.
   e. Identify the abbreviations for each of the symbols drawn.

2. Given presentations and related assignments on architectural symbols, the student will utilize these symbols in drawing a floor plan.

   In order to do this, the student must be able to:

   a. Implement the various material symbols in floor plans and elevation views.
   b. Implement the various window and door symbols found on the floor plan.
   c. Implement the abbreviations for the symbols.

3. Given presentations, related assignments, and questions to answer, the student will draw and describe features of a residential foundation and framing plan.

   In order to do this, the student must be able to:

   a. Identify and draw at least two foundations/footing types.
   b. Locate and draw supporting members such as joists and girders.
   c. Use appropriate architectural symbols.
   d. Locate and draw wall studs and joining members.
   e. Design support for wall openings.
   f. Design and draw at least two common roof framing diagrams.
   g. Design and draw one or more stairway diagrams.

COURSE: **ARCHITECTURAL DRAWING**
MODULE: **ARCHITECTURAL DRAWING TECHNIQUES**
TOPIC: **Sections/Framing**

SUGGESTED INSTRUCTION STRATEGIES

1. Provide students with models of house framing details.

2. Develop an audio-visual slide presentation illustrating a residential home being constructed from the foundation up.

3. Present films and videotapes on house construction.

4. Plan a field trip to a construction site.

5. Have student use a floor plan on a CAD system to develop a wall section detail.

COURSE: **ARCHITECTURAL DRAWING**
MODULE: **ARCHITECTURAL DRAWING TECHNIQUES**
TOPIC: **Exterior Elevations**

PERFORMANCE OBJECTIVES/SUPPORTING COMPETENCIES

1. Given a presentation and overview on the importance of exterior elevation drawings, the student will describe a series of structures with respect to style, roof, and appearance.

   In order to do this, the student must be able to:

   a. Name four of the five basic types of structures.
   b. Identify seven out of ten roof styles from a given grouping.
   c. Write a paragraph explaining the relationship of surface material and texture, doors, windows, and chimneys to the total appearance of an elevation drawing.
   d. Identify formally and informally balanced elevations from a given series of illustrations.

2. Given an introduction, instruction, and sample problems the student will draw an exterior elevation from a floor plan as per specifications provided by the instructor.

   In order to do this, the student must be able to:

   a. Establish an elevation plane.
   b. Establish the major lines of an elevation by projecting vertical lines from the floor plan.
   c. Determine the roof pitch and project the ridge and eave lines.
   d. Add siding, door, and window symbols.
   e. Dimension the elevation.

COURSE: **ARCHITECTURAL DRAWING**
MODULE: **ARCHITECTURAL DRAWING TECHNIQUES**
TOPIC: **Exterior Elevations**

SUGGESTED INSTRUCTION STRATEGIES

1. Show slide series, filmstrip, movie and or videotape on elevations of different style houses and structures and discuss how they differ.

2. Present a sample floor plan to the students and have students develop an elevation.

3. Have students sketch an elevation of their own home.

4. Sketch a floor plan on the chalk board. Working from that sketch develop different elevations and sketch them on the board.

5. Have the students develop a complete front and side elevation from a floor plan they have previously drawn.

6. Have the students develop an elevation view from a floor plan on a CAD system.

COURSE: **ARCHITECTURAL DRAWING**
MODULE: **ARCHITECTURAL DRAWING TECHNIQUES**
TOPIC: **Perspectives**

PERFORMANCE OBJECTIVES/SUPPORTING COMPETENCIES

1. Given assigned readings and instruction, perspective architectural drawings, the student will name and describe.

   In order to do this, the student must be able to:

   a. Explain the significance of perspective drawings.
   b. Identify the different types of perspective drawings.
   c. Identify and explain use of specialized perspective drawings/equipment.
   d. Explain how perspective drawings can be produced on CAD systems.
   e. Identify the characteristics and use of interior and exterior perspectives.
   f. Define the uses of renderings, media, shade, shadow, texture, and color.

2. Given an introduction, instruction, and sample problems the student will use the tools/equipment and materials of architectural drawing to produce lines and symbols suitable for architectural perspective drawings.

   In order to do this, the student must be able to:

   a. Sketch a perspective drawing.
   b. Select and use drafting equipment specifically designed for perspective drawings.
   c. Construct a basic perspective architectural drawing.
   d. Apply the methods of architectural model construction.
   e. Use drawing instruments to produce drafting techniques suitable for architectural perspective drawings.
   f. Use time-efficient items in the preparation of architectural perspective drawings.

COURSE: **ARCHITECTURAL DRAWING**
MODULE: **ARCHITECTURAL DRAWING TECHNIQUES**
TOPIC: **Perspectives**

SUGGESTED INSTRUCTIONAL STRATEGIES

1. Provide students practice with the principles of art and applied mathematics.

2. Show examples/displays of work done by professionals and former students illustrating both good and bad technique.

3. Invite guest speakers from engineering, drafting, architecture, college, technical education fields, and former students.

4. Show films/slides/video cassettes on architectural perspective drawing techniques and careers in architectural drawing.

5. Conduct a field trip to any of the following: local community colleges, civil engineering firms, light or heavy industry, architectural firms, or town planning boards.

6. Assign students perspective problems on standard 8 1/2" x 11" paper, the conversion for the student to the larger 17" x 22" drawing size (perspective) being exactly double.

7. Have students use exterior perspective grids.

8. Assign perspective drawings which demonstrate architectural line quality and technique.

9. Provide a hot glue gun for the efficient construction of architectural models.

10. Have students trace one of their perspective drawings on vellum. Then, using pencil accents and pastel chalk colors applied with cotton or tissues, have them create a rendering. Mask areas with a scrap of paper having a sharp edge (as between the roof and sky). Add trees, etc.

11. Have students develop a perspective drawing from a 3-D CAD floor plan.

12. Have students develop a 3-D model of a house for a client presentation.

COURSE: **ARCHITECTURAL DRAWING**
MODULE: **CAREER EXPLORATION**

Estimated Teaching Time - 3 hours

COURSE: **ARCHITECTURAL DRAWING**
MODULE: **CAREER EXPLORATION**

OVERVIEW OF MODULE

Goal

The student will gain awareness of careers in the architectural drawing field and employment opportunities in occupations related to architectural drawing.

Description

In almost every instance of design and construction, someone with a background in architectural drawing plays a vital role in the development. The ability to make architectural drawings, or to interpret and explain them, is very useful in modern society.

Skills, Knowledge, and Behaviors to be Developed

The ability to:

1. Describe the importance of architectural drawing in design and construction.
2. Identify careers in architectural drawing.
3. Identify uses of architectural drawing skills in a wide range of career fields.
4. Explain educational and skill requirements for selected architectural drawing jobs.
5. Use resources to learn more about careers in architectural drawing.

COURSE: ARCHITECTURAL DRAWING
MODULE: CAREER EXPLORATION

PERFORMANCE OBJECTIVES/SUPPORTING COMPETENCIES

1. Given a presentation(s) on job classifications within the field of architectural drawing, the student will describe the jobs and the preparation needed to obtain these jobs.

   In order to do this, the student must be able to:

   a. Identify major job classifications in the field of architectural drawing.
   b. Explain the educational and skill requirements relevant to the job classifications.

2. Given a presentation(s) on employment opportunities in occupations related to architectural drawing, the student will describe several of these occupations.

   In order to do this, the student must be able to:

   a. Recognize the range of jobs that utilize architectural drawing skills.
   b. Identify the educational and skill requirements for several of the jobs.

3. Given an overview of careers using dimensioning, perspective drawing, planning drawings, etc., the student will select an area, investigate opportunities and requirements for employment, and relate these to his or her own abilities and career aspirations.

   In order to do this, the student must be able to:

   a. Explain the uses of a selected area of architectural drawing in the work world.
   b. Research the qualifications required for a job in that area and the availability of employment.
   c. Assess his or her own talents and ambitions and compare them to the job requirements.

COURSE: **ARCHITECTURAL DRAWING**
MODULE: **CAREER EXPLORATION**

SUGGESTED INSTRUCTIONAL STRATEGIES

1. Visit a firm employing people involved with architectural drawing or a relate field.

2. Invite guest speakers from careers involved with architectural drawing to address the class.

3. Have students undertake original research concerning careers using architectural drawing and report upon their findings to the group.

4. Assign students in groups to interview someone with an architectural drawing background.

5. Display/examine architectural drawings used in various fields.

6. Have students research in the Occupational Outlook Handbook, the careers associated with architectural dimensioning, perspective drawing, site plans, etc.

7. Have a student "shadow" an architect for a day and report back to class.

COURSE: ARCHITECTURAL DRAWING

RESOURCES

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*Piper, R. Opportunities in Architecture Today. Louisville, KY: Vocational Guidance Manuals, Inc., 1975.

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*Roth, R. Your Future in Architecture. New York: Richard Rosen Press, Inc., 1979.

Spence, W.P. Architecture: Design, Engineering, Drawing, Bloomington: McKnight Publishing Co., 1979.

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