Hamburg Area School District

Name of Course: Architectural Drawing
Grade Level: 9-12
Department: Industrial Technology and Engineering
Instructional Time: 180 days
Length of Course: 30 Cycles
Period Per Cycle: 6
Length of Period: 43

Texts and Resources:
- Architectural Residential Drafting and Design
- Architectural Drafting and Design
- Drafting and Design for Architecture
- Architecture: Residential Drafting and Design
- .autodesk.com
- .afsonl.com
- .thebluebook.com
- .builderonline.com
- .dreamhomesmag.com
- .build.com
- .nahbrc.org
- .residentialarchitect.com
- Fine Homebuilding Magazine
- Architectural Record Magazine

Assessments:
- Individual Projects
- Group Projects
- Chapter Questions
- Tests and Quizzes
- Self Evaluations
- Rubrics
- Demonstrations
- Notebooks
### Course Name: Architectural Drawing
#### Unit: Introduction to Architectural Drawing

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<th>Essential Content/ Essential Questions</th>
<th>Performance Objectives</th>
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<tr>
<td>What career opportunities are available in architectural drafting?</td>
<td>• Identify various career opportunities related to architectural drafting</td>
<td>3.4.10.A1.</td>
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</table>
| What are the historical styles of architecture? | • Identify different architectural styles  
• Differentiate between the main characteristics of architectural styles  
• Identify the historical influences that help shape structural designs  
• Recognize the historical impact on architectural designs | 3.4.10.B3.  
| What are the fundamentals of design? | • List and apply the elements of design  
• List and apply the principles of design  
• Explain the difference between elements and principles of design  
• Relate design concepts to architecture  
• Apply design principles to a specific work of architecture | 3.4.10.E7 |
| What equipment is used in Architectural drawing? | • Identify and explain the use for the following equipment:  
  - Pencil, eraser, erasing shield, drawing board, t-square, protractor, scale, dividers, compass, lettering guide, irregular curves, templates  
  - Recognize the impact CAD has on the drafting profession | 3.4.10.B4. |
| What is Computer Aided Drafting and how is it used in Architecture? | • List and explain the different kinds of CAD hardware and software  
• Describe and utilize the major commands for drawing and editing  
• Identify how a CAD system is used to create architectural drawings | 3.4.10.B4. |
## Hamburg Area School District
### Course Plan
#### Architectural Drawing

**Course Name:** Architectural Drawing  
**Unit:** Basic Area Design  
**Time Line:** 5 cycles

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| What are environment design factors?   | • List ecological factors to be considered in planning a residence.  
                   • Analyze a lot and identify how to orient a house to take best advantage of solar energy and environmental features.  
                   • Identify ways to prevent pollution  
                   • Identify how to design structures ergonomically | 3.4.10.C1.  
3.4.10.E7 |
| How are indoor living areas designed?  | • Identify the functions of indoor living areas  
                   • Design the location, décor, size, and shape of indoor living areas  
                   • Recognize how a room’s orientation, walls, floors, windows, ceilings, lighting, and furniture can contribute to room function and appearance.  
                   • Design indoor living areas and work them into a convenient floor plan | 3.4.10.C1.  
3.4.10.E7 |
| How are outdoor living areas designed? | • Design and sketch a porch, patio, and lanai  
                   • List factors to consider in designing a pool  
                   • Design and sketch a swimming pool  
                   • Calculate the area and volume of swimming pools  
                   • Identify function and types of porches  
                   • List safety equipment used for swimming pools | 3.4.10.C1.  
3.4.10.E7 |
| What are the considerations for designing traffic areas and patterns? | • Determine the effectiveness of a traffic pattern in a house  
                   • Design and plan hallways that function efficiently  
                   • List guidelines for designing stairs  
                   • Calculate the correct space needed for stairways and stairwells  
                   • List and identify the kinds and functions of entrances  
                   • List guidelines for entrance design  
                   • Design a foyer and entry way | 3.4.10.C1.  
3.4.10.E7 |
## Hamburg Area School District
### Course Plan
#### Architectural Drawing

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| What are kitchen design considerations?| • Apply guidelines to efficient kitchen design  
• Determine the best shape, size, and location for the kitchen  
• Plan a work triangle for a kitchen  
• Design an aesthetically consistent décor for a kitchen  
• Sketch small and large kitchens of the basic kitchen shapes | 3.4.10.C1.  
3.4.10.E7 |
| What are general service areas?        | • Determine what kinds of equipment are included in a utility room  
• Evaluate the best location for a utility room  
• Sketch a garage and a carport  
• Design storage facilities for a garage  
• Calculate the area needed for garages and driveways  
• Design and sketch an efficient and safe workshop area  
• Design and sketch storage facilities | 3.4.10.C1.  
3.4.10.E7 |
| How are sleeping areas designed?       | • Plan and draw bedrooms for a sleeping area  
• Plan and draw baths appropriate to the size and arrangement of the floor plan  
• Design an efficient bath | 3.4.10.C1.  
3.4.10.E7 |
### Course Name: Architectural Drawing  
#### Unit: Basic Architectural Drawings

**Time Line:** 6 cycles

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| How are floor plans designed?         | - Gather information from a client that is needed to design an architectural project  
- Analyze a building site  
- Use the design process to prepare for drawing accurate and functional floor plans  
- Design and Create floor plan sketches  
- Design floor plans to accommodate the needs of persons with physical impairments | 3.4.10.C1.  
3.4.10.E7 |
| How are floor plans drawn?            | - Use information on a scaled floor plan to draw a complete floor plan  
- Name and explain the types of floor plans  
- Use graphic symbols to communicate information on a floor plan  
- Draw a floor plan according to a sequence of steps  
- Draw dimensions that convey precise, accurate information for builders | 3.4.12.C3. |
| How are elevations designed?          | - Apply the principles and elements of design to creating elevation drawings  
- Recognize different roof styles as options for roof design  
- Select and design window styles in relation to elements of design and window functions  
- Locate doors on an elevation design, considering style, size, and types of doors | 3.4.10.C1.  
3.4.10.E7 |
| How are elevations drawn?             | - Follow steps to project elevations from a floor plan and complete an elevation drawing  
- Draw accurately scaled and dimensioned elevations  
- Mathematically establish the pitch of a roof  
- Identify symbols used on elevations  
- Utilize shading and rendering techniques to use on elevations | 3.4.12.C3. |
## Course Plan
### Architectural Drawing

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| How do you create section, detail, and cabinetry drawings? | • Describe types of sectional drawings  
• Communicate views of sections based on a cutting plane  
• Draw sections, using correct codes and proper dimensioning  
• Evaluate when a detail sectional drawing is needed  
• Read and prepare detail drawings  
• Design and prepare cabinet drawings | 3.4.10.C1. |
| What are site development plans? | • Identify the major elements used in site design  
• Recognize the role and uses of zooming ordinance in the design process  
• Draw survey, plat, and plot plans  
• Recognize the polar coordinate system and its application to site plans  
• Design, draw, and render landscape plans and elevations | 3.4.12.C3. |
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<td>What are pictorial drawings?</td>
<td>• Differentiate between isometric, oblique, and perspective drawings</td>
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<td>• Apply principles of perspective drawing to create interior and exterior pictorial drawings</td>
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<td>• Identify geometric principles involved in projecting lines to create 3D images</td>
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<td>• Utilize projection methods for drawing pictorials</td>
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<td>What are architectural renderings?</td>
<td>• Recognize the wide selection of media available for renderings</td>
<td>3.4.10.E7.</td>
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<td>• Evaluate when to use which media to achieve an artistic effect</td>
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<td>• Add realism to drawings by the use of shading, shadows, texture, entourage, and landscapes</td>
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<td>• Follow the correct sequence for preparing a rendering</td>
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<td>What are the methods for creating architectural models?</td>
<td>• Describe architectural models made for design study purpose</td>
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<td>• Explain the difference between presentation and design study models</td>
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<td>• Construct an Architectural models</td>
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<td>• Describe what input is needed to create a computer model</td>
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# Hamburg Area School District
## Course Plan
### Architectural Drawing

**Course Name:** Architectural Drawing  
**Unit:** Foundations and Construction Systems  
**Time Line:** 6 cycles

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| What are the principles of construction? | • Name and define the physical forces that act on a building  
• Describe the factors that determine the strength of structural components  
• Draw a modular floor plan, elevation, and detail drawing | 3.4.10.E7. |
| What are the types of foundations and fireplace structures? | • Describe the types of foundations  
• Identify the components and materials used in foundations  
• Design a fireplace with sufficient structural support and appropriate safety components  
• Draw foundation plans  
• Relate the layout and excavations for a building to the type of foundation it will have | 3.4.10.E7. |
| What are wood-frame systems? | • Differentiate between skeleton-frame and post-and-beam construction  
• Identify major characteristics of lumber, plywood, and structural timber  
• Calculate the number of board feet in a piece of lumber | 3.4.10.E7. |
| What are masonry and concrete systems? | • Identify the types of masonry materials used in construction  
• Describe four types of masonry walls  
• Describe ways to strengthen concrete and prevent deflection  
• Explain how concrete is used for slabs and other structural components | 3.4.10.E7. |
## Architectural Drawing

### Unit: Foundations and Construction Systems

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| How are steel and reinforced-concrete systems used in construction? | - Describe three types of steel construction and explain the basic purpose of each  
- Identify manufactured steel forms and their function as structural members  
- Read and interpret steel symbols, weld notations, identification, and measurements for working drawings  
- Relate the types of fasteners and intersections of steel members to construction methods | 3.4.10.E7. |
| What is disaster prevention design? | - Describe the measures that can be taken during construction to minimize potential damage from natural disasters  
- Describe how to prevent gas leaks  
- Name ways to provide fire protection for a structure and its residents  
- Discuss methods for ensuring clean air and water in a building | 3.4.10.E7. |
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| How are floor framing drawings produced? | • Identify the components of floor systems  
• Draw a floor framing plan that shows all structural parts  
• Draw details of sills, supports, and stairwells | 3.4.10.E7. |
| How are wall framing drawings produced? | • Draw an exterior wall framing elevation and plan  
• Draw an interior wall framing elevation and plan  
• Draw details and sections of walls  
• Draw wall intersections | 3.4.10.E7. |
| How are roof framing drawings produced? | • Describe roof framing members, components and methods  
• Calculate roof pitch  
• Draw a roof framing plan showing structural members, size, pitch, and spacing  
• Draw roof framing details and elevations | 3.4.10.E7. |
Course Name: Basic Electrical and Mechanical Design Drawings

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| How are electrical systems designed and drawn? | • Plan and draw electrical circuits for a house on a floor plan  
• Plan and draw lighting for each room in a house  
• Calculate electrical measurements for each circuit  
• Draw electrical symbols  
• Design and draw an electronic building control system | 3.4.10.E7. |
| What are the different types of HVAC systems and how are they drawn? | • Plan and draw a mechanical heating and cooling system on a floor plan  
• Use appropriate symbols to draw devices, ductwork, or piping for heating and cooling systems  
• Calculate heat loss to design HVAC systems needed for specific situation  
• Plan and draw a passive and active solar heating and cooling system | 3.4.10.E7. |
| How are plumbing drawings produced? | • Draw plumbing fixture on a floor plan  
• Draw the water supply lines and waste discharge system on a floor plan  
• Draw the water supply lines and waste discharge system on an elevation | 3.4.10.E7. |