

# Architectural/CAD I

## Curriculum Content Frameworks

**Please note: All assessment questions will be taken from the knowledge portion of these frameworks.**

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Career and Technical Education  
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Arkansas Department of Workforce Education

# Curriculum Content Frameworks

## Architectural/CAD I

Grade Levels: 9-12  
Course Code: 494710

Prerequisite: Drafting and Design

Course Description: Architectural/CAD I focuses on the knowledge and skills required to plan and prepare scale pictorial interpretations of plans and design concepts for residential buildings. Emphasis is given to the development of competencies related to solving drafting and design problems that require the individual to understand and apply a wide range of technical knowledge and critical thinking skills. The course is designed to allow the student to produce drawings as traditional or computer-aided drawings.

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# Unit 1: Practicing Safety

## Hours: 2

Terminology: Hazard, Shock

<b>CAREER and TECHNICAL SKILLS</b>		<b>ACADEMIC and WORKPLACE SKILLS</b>			
What the Student Should be Able to Do		What the Instruction Should Reinforce			
Knowledge	Application	Skill Group	Skill	Description	
1.1 Define terminology related to practicing safety	1.1.1 Use terms appropriately in context	Foundation	Reading	Applies/Understands technical words that pertain to safety in regards to architectural and computer-aided drafting [1.3.6]	
			Writing	Applies/Uses technical words and concepts [1.6.4]  Uses words appropriately [1.6.21]	
1.2 List general safety guidelines	1.2.1 Describe guidelines for safe handling of drafting tools, equipment, and furniture	Foundation	Listening	Comprehends ideas and concepts related to architectural and computer-aided drafting [1.2.1]	
	1.2.2 Demonstrate safety precautions regarding electrical equipment used in drafting		Reading	Follows written directions [1.3.13]	
	1.2.3 Outline drafting classroom safety guidelines	Thinking	Decision Making	Accepts responsibility for decision [4.2.1]	
	1.2.4 Demonstrate the use of school emergency plans			Evaluates information/data to make best decision [4.2.5]	

## Unit 2: Preparing for a Career in Drafting

### Hours: 2

Terminology: Architecture, Career portfolio

CAREER and TECHNICAL SKILLS		ACADEMIC and WORKPLACE SKILLS			
What the Student Should be Able to Do		What the Instruction Should Reinforce			
Knowledge	Application	Skill Group	Skill	Description	
2.1 Define terminology related to careers in drafting	2.1.1 Use terms appropriately in context	Foundation	Reading	Applies/Understands technical words that pertain to preparing for a career in drafting [1.3.6]	
			Writing	Applies/Uses technical words and concepts [1.6.4]  Uses words appropriately [1.6.21]	
2.2 Describe career options in drafting	2.2.1 Evaluate career education requirements in architectural drafting for an architect, architectural draftsman, model maker, teacher, and technical illustrator	Foundation	Speaking	Speaks effectively, using appropriate eye contact, gestures, and posture [1.5.11]	
2.3 List job responsibilities for various drafting occupations	2.3.1 Revise a high school career action plan in drafting with several career options	Foundation	Reading	Comprehends written information, and applies it to a task [1.3.8]	
	2.3.2 Research requirements for a community college architecture major	Personal Management	Career Awareness, Development, and Mobility	Sets well-defined and realistic personal/career goals (short-term and long-term) [3.1.11]	
	2.3.3 Research requirements for a college major in engineering HVAC systems	Thinking	Reasoning	Comprehends ideas and concepts related to architectural and computer-aided drafting [4.5.2]	
	2.3.4 Explore interest in various occupational areas utilizing drafters				

<b>CAREER and TECHNICAL SKILLS</b>		<b>ACADEMIC and WORKPLACE SKILLS</b>			
What the Student Should be Able to Do		What the Instruction Should Reinforce			
<b>Knowledge</b>	<b>Application</b>	<b>Skill Group</b>	<b>Skill</b>	<b>Description</b>	
2.4 Identify potential barriers to career advancement	2.4.1 List potential barriers to career advancement	Foundation	Speaking	Organizes ideas, and communicates oral messages to listeners [1.5.7]	
	2.4.2 List common failures made by drafting employees to meet workplace expectations	Personal Management	Career Awareness, Development, and Mobility	Sets well-defined and realistic personal/career goals (short-term and long-term) [3.1.11]	
	2.4.3 Discuss results of failure to keep current with technical knowledge and skills	Thinking	Creative Thinking	Forms opinions [4.1.7]	
	2.4.4 Describe workplace discrimination (based upon such factors as gender, ethnicity, age, or physical disability)				
	2.4.5 Discuss state and federal employment laws and company human resources policies				
2.5 Describe strategies for removing potentials barriers to career advancement	2.5.1 Participate in professional development programs	Personal Management	Career Awareness, Development, and Mobility	Sets well-defined and realistic personal/career goals (short-term and long-term) [3.1.11]	
	2.5.2 Develop an appreciation of the benefits of constructive criticism		Integrity/Honesty/Work Ethic	Describes desirable worker characteristics [3.2.3]	

## Unit 3: Using Mathematics in Drafting

### Hours: 3

Terminology: Board foot, Coverage, Square foot

CAREER and TECHNICAL SKILLS		ACADEMIC and WORKPLACE SKILLS			
What the Student Should be Able to Do		What the Instruction Should Reinforce			
Knowledge	Application	Skill Group	Skill	Description	
3.1 Define terminology related to mathematics in drafting	3.1.1 Use terms appropriately in context	Foundation	Reading	Applies/Understands technical words that pertain to architectural and computer-aided drafting [1.3.6]	
			Writing	Applies/Uses technical words and concepts [1.6.4]  Uses words appropriately [1.6.21]	
3.2 Determine mathematic conversions used in preparing architectural drawings	3.2.1 Perform calculations to convert inches to feet and feet to inches	Foundation	Arithmetic/ Mathematics	Converts different units of measurement [1.1.17]	
	3.2.2 Perform calculations to convert centimeters to millimeters and millimeters to centimeters				
	3.2.3 Perform calculations to convert cubic feet to cubic yards and cubic yards to cubic feet				
3.3 Describe basic mathematical skills used in architectural drafting occupations	3.3.1 Apply the principles of addition, subtraction, multiplication, and division involving whole numbers, fractions, mixed numbers, and decimals	Foundation	Arithmetic/ Mathematics	Constructs graphs/charts/tables [1.1.16]	
	3.3.2 Convert common fractions to decimal fractions and decimal fractions to common fractions				

<b>CAREER and TECHNICAL SKILLS</b>		<b>ACADEMIC and WORKPLACE SKILLS</b>				
What the Student Should be Able to Do		What the Instruction Should Reinforce				
<b>Knowledge</b>	<b>Application</b>	<b>Skill Group</b>	<b>Skill</b>	<b>Description</b>		
3.4	Identify mathematical calculations involving practical geometry and trigonometry	3.4.1	Apply practical geometry and trigonometry principles using the Pythagorean Theorem (3-4-5 triangle)	Foundation	Arithmetic/ Mathematics	Computes using a formula [1.1.14]  Uses basic algebraic symbols, terms, principles, and formulas [1.1.33]  Uses basic geometric symbols, terms, principles, and formulas [1.1.34]
		3.4.2	Use mathematical formulas to calculate area			
		3.4.3	Use mathematical formulas to calculate volume			
		3.4.4	Explain practical applications of the Pythagorean Theorem (3-4-5 triangle)			
3.5	Describe procedures to compute material quantities used in residential construction	3.5.1	Estimate cubic yards of concrete for footings from architectural drawings	Foundation	Arithmetic/ Mathematics	Estimates arithmetic results without a calculator [1.1.22]  Makes rough measurements [1.1.28]
		3.5.2	Estimate quantities of lumber for floor framing, wall framing, and roof framing			
		3.5.3	Estimate quantities of wall and floor coverings from architectural drawings			
		3.5.4	Estimate quantities of roofing and siding materials from architectural drawings			
		3.5.5	Estimate quantities of plumbing fixtures and electrical materials from architectural drawings			

## Unit 4: Orientation to Architectural and Computer-Aided Drafting

### Hours: 8

Terminology: Architectural style, Scale

CAREER and TECHNICAL SKILLS What the Student Should be Able to Do			ACADEMIC and WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	Application		Skill Group	Skill	Description
4.1 Define terminology related to architecture	4.1.1	Use terms appropriately in context	Foundation	Reading	Applies/Understands technical words that pertain to architectural and computer-aided drafting [1.3.6]
				Writing	Applies/Uses technical words and concepts [1.6.4]  Uses words appropriately [1.6.21]
4.2 Describe types of architectural drawings	4.2.1	Show components found on architectural floor plans, elevations, and electrical plans	Foundation	Writing	Presents answers/conclusions in a clear and understandable form [1.6.13]  Uses technical words and symbols [1.6.20]
	4.2.2	Demonstrate various uses for architectural drawings	Thinking	Reasoning	Comprehends ideas and concepts related to architectural and computer-aided drafting [4.5.2]
	4.2.3	Use the architect's scale to make measurements on architectural drawings			
	4.2.4	Summarize the meaning of scales used on various architectural drawings			

CAREER and TECHNICAL SKILLS		ACADEMIC and WORKPLACE SKILLS		
What the Student Should be Able to Do		What the Instruction Should Reinforce		
Knowledge	Application	Skill Group	Skill	Description
4.3 Describe techniques for developing freehand field sketches of architectural features	4.3.1 Apply techniques for developing field sketches, using drawing instruments  4.3.2 Draw simple field sketches (with or without drawing instruments) of architectural features	Thinking	Seeing Things in the Mind's Eye	Organizes and processes images – symbols, pictures, graphs, objects, etc. [4.6.2]
4.4 Define <i>freehand lettering</i>	4.4.1 Compose typical notes found on architectural and technical drawings, using freehand lettering techniques	Foundation	Writing	Uses technical words and symbols [1.6.20]  Writes/Prints legibly [1.6.24]

## Unit 5: Performing Computer-Aided Drafting (CAD) Operations

### Hours: 10

Terminology: AIA, CAD, Plotter

CAREER and TECHNICAL SKILLS What the Student Should be Able to Do			ACADEMIC and WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	Application	Skill Group	Skill	Description	
5.1 Define terminology related to CAD operations	5.1.1 Use terms appropriately in context	Foundation	Reading	Applies/Understands technical words that pertain to CAD operations [1.3.6]	
			Writing	Applies/Uses technical words and concepts [1.6.4]  Uses words appropriately [1.6.21]	
5.2 Identify components of a CAD system used in an architectural firm	5.2.1 Describe the purpose of basic components of a CAD system (CPU, monitor, keyboard, mouse/digitizer, plotter, printer, and CAD software)	Foundation	Speaking	Applies/Uses technical terms appropriate to audience [1.5.2]  Communicates a thought, idea, or fact in spoken form [1.5.5]	
	5.2.2 Describe common features of CAD software programs	Thinking	Reasoning	Determines which conclusions are correct when given a set of facts and a set of conclusions [4.5.3]	
	5.2.3 Navigate CAD system command menus				
5.3 Outline the fundamentals of computer skills used in preparing architectural drawings	5.3.1 Manage files (i.e., saving, naming, backing up, organizing)	Foundation	Science	Applies a scientific principle to solve a problem [1.4.7]	
	5.3.2 Set up a CAD system for architectural drawings	Thinking	Writing	Produces neat, legible document from typewriter or computer [1.6.15]	
	5.3.3 Demonstrate ability to perform basic word processing (compose, cut, copy, paste, print) to prepare architectural specifications		Decision Making	Comprehends ideas and concepts related to Architectural/CAD I [4.2.2]	

CAREER and TECHNICAL SKILLS What the Student Should be Able to Do			ACADEMIC and WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	Application	Skill Group	Skill	Description	
5.4 Describe procedures to change CAD drawing setups	5.4.1 Modify drawing limits, units of measurement, text styles and size, and dimension variables	Foundation	Arithmetic/ Mathematics	Uses computer in mathematical applications, information processing, and problem solving [1.1.38]	
	5.4.2 Modify settings for various drawing aids (i.e., snap, grid, and polar)	Thinking	Problem Solving	Devises and implements a plan of action to resolve a problem [4.4.3]	
	5.4.3 Modify settings for various layers for a CAD drawing				
5.5 List CAD drawing commands to prepare architectural drawings	5.5.1 Use CAD drawing commands to construct lines, circles, arcs, polylines, polygons, ellipses, rectangles, text, and hatch patterns	Foundation	Science	Applies knowledge to complete a practical task [1.4.3]	
	5.5.2 Create blocks or symbols for architectural drawings, using CAD commands				
	5.5.3 Insert various symbols in architectural drawings				
5.6 Describe techniques used to edit and modify architectural drawings	5.6.1 Use CAD commands to change or modify an architectural drawing (i.e., move, copy, mirror, break, offset, fillet, stretch, scale, rotate, trim/extend, erase, edit text, explode, grips, and array)	Thinking	Creative Thinking	Creates new design by applying specified criteria [4.1.3]	
	5.6.2 Use CAD commands to change or modify lines and features of a floor plan, elevation drawing, wall section drawing, or cabinet detail		Problem Solving	Demonstrates logical reasoning in reaching a conclusion [4.4.2]	
	5.6.3 Use CAD commands to modify floor plans and electrical plans			Interprets drawings to solve design problems [4.4.7]	

<b>CAREER and TECHNICAL SKILLS</b>		<b>ACADEMIC and WORKPLACE SKILLS</b>			
What the Student Should be Able to Do		What the Instruction Should Reinforce			
<b>Knowledge</b>	<b>Application</b>	<b>Skill Group</b>	<b>Skill</b>	<b>Description</b>	
5.7 List features used when adding dimensions on architectural drawings	5.7.1 Use CAD dimensioning commands to place size and location dimensions on architectural floor plans, wall sections, elevation drawings, and cabinet details	Thinking	Problem Solving	Demonstrates logical reasoning in reaching a conclusion [4.4.2]	
	5.7.2 Use CAD commands to place notes and leaders on an architectural drawing				
	5.7.3 Set up and change CAD dimensioning styles for an architectural drawing				
5.8 Outline how to organize work using CAD file commands	5.8.1 Use CAD file commands to organize files and folders	Thinking	Decision Making	Demonstrates decision-making skills [4.2.4]	
	5.8.2 Use CAD file commands to plot, import, and export a drawing file				
5.9 Explain methods to create various features when preparing CAD architectural drawings	5.9.1 Prepare CAD architectural drawings of floor plans, elevations, wall sections, foundation plans, and site plans, using line types, line weights, dimensions, notes, details, and section views	Thinking	Problem Solving	Recognizes/Defines problem [4.4.8]	
5.10 Describe techniques to produce plots of CAD drawings	5.10.1 Scale architectural drawings using a CAD system	Thinking	Problem Solving	Demonstrates logical reasoning in reaching a conclusion [4.4.2]	
	5.10.2 Plot drawings to various scales				
	5.10.3 Set and modify plot scale settings for a CAD file				
	5.10.4 Plot architectural drawings having single and multiple view ports				

## Unit 6: Orientation to Architectural Drafting

### Hours: 5

Terminology: ADA, Frost line, Vapor barrier

CAREER and TECHNICAL SKILLS		ACADEMIC and WORKPLACE SKILLS			
What the Student Should be Able to Do		What the Instruction Should Reinforce			
Knowledge	Application	Skill Group	Skill	Description	
6.1 Define terminology related to architectural drafting	6.1.1 Use terms appropriately in context	Foundation	Reading	Applies/Understands technical words that pertain to architectural drafting [1.3.6]	
			Writing	Applies/Uses technical words and concepts [1.6.4]  Uses words appropriately [1.6.21]	
6.2 Outline key developments in the history of architecture	6.2.1 Identify the contributions to modern architecture and building practices made by notable architects	Foundation	Speaking	Asks questions to clarify information [1.5.3]	
	6.2.2 Distinguish among the characteristics of architectural styles of historical periods, including Roman, Gothic, and Colonial			Communicates a thought, idea, or fact in spoken form [1.5.5]  Participates in conversation, discussion, and group presentations [1.5.8]	
6.3 List basic principles behind building codes	6.3.1 Evaluate the underlying reasons for building codes, including safety, consumer protection, legal requirements (ADA provisions), standardization of fixtures (electrical, plumbing, HVAC, cabinets), and fire prevention	Foundation	Science	Analyzes environmental issues (ecology, pollution, waste management) [1.4.2]  Applies knowledge to complete a practical task [1.4.3]	
6.4 Identify items that comprise a set of architectural drawings	6.4.1 Discuss types of information necessary to construct a building	Foundation	Speaking	Communicates a thought, idea, or fact in spoken form [1.5.5]	
	6.4.2 Identify types of working drawings included in a set of plans for residential construction			Speaks effectively, using appropriate eye contact, gestures, and posture [1.5.11]	
	6.4.3 Explain the reasons for various types of plans needed for building construction				

<b>CAREER and TECHNICAL SKILLS</b>		<b>ACADEMIC and WORKPLACE SKILLS</b>		
What the Student Should be Able to Do		What the Instruction Should Reinforce		
<b>Knowledge</b>	<b>Application</b>	<b>Skill Group</b>	<b>Skill</b>	<b>Description</b>
6.5 List the components of a cover sheet for a set of architectural drawings	6.5.1 Set scale/size for items on the cover sheet for a set of architectural drawings	Foundation	Writing	Organizes information in an appropriate format [1.6.10]
	6.5.2 Create an index for a set of architectural drawings			Uses language, style, organization, and format appropriate to subject matter, purpose, and audience [1.6.19]
	6.5.3 Prepare a cover sheet indicating the content, job identification, and other pertinent information for a set of architectural drawings	Thinking	Seeing Things in the Mind's Eye	Visualizes a finished product [4.6.4]

## Unit 7: Performing Architectural Drafting Operations

### Hours: 15

Terminology: Building code, Building inspector, Living area

CAREER and TECHNICAL SKILLS What the Student Should be Able to Do		ACADEMIC and WORKPLACE SKILLS What the Instruction Should Reinforce			
Knowledge	Application	Skill Group	Skill	Description	
7.1 Define terminology related to architectural drafting operations	7.1.1 Use terms appropriately in context	Foundation	Reading	Applies/Understands technical words that pertain to architectural and computer-aided drafting [1.3.6]	
			Writing	Applies/Uses technical words and concepts [1.6.4]  Uses words appropriately [1.6.21]	
7.2 Describe line conventions used on architectural drawings	7.2.1 Apply common line symbols to architectural drawings	Foundation	Speaking	Applies/Uses technical terms appropriate to audience [1.5.2]	
	7.2.2 Apply various special line symbols to architectural drawings	Thinking	Decision Making  Problem Solving	Evaluates information/data to make best decision [4.2.5]  Interprets drawings to solve design problems [4.4.7]	
7.3 Describe the meaning for symbols used on architectural drawings	7.3.1 Give examples of how architectural symbols are used to communicate information for construction of a building	Foundation	Speaking	Applies/Uses technical terms appropriate to audience [1.5.2]	
	7.3.2 Describe techniques for creating and placing various architectural symbols on drawings			Communicates a thought, idea, or fact in spoken form [1.5.5]	
	7.3.3 Describe types of symbols typically found on architectural drawings			Organizes ideas, and communicates oral messages to listeners [1.5.7]	
	7.3.4 Research architectural symbols to use on drawings				

CAREER and TECHNICAL SKILLS			ACADEMIC and WORKPLACE SKILLS			
What the Student Should be Able to Do			What the Instruction Should Reinforce			
Knowledge	Application		Skill Group	Skill	Description	
7.4 List dimensioning methods used on architectural drawings	7.4.1	Demonstrate dimensioning methods used on architectural drawings	Foundation	Arithmetic/ Mathematics	Comprehends mathematical ideas and concepts related to Architectural/CAD I [1.1.13]	
	7.4.2	Demonstrate how notes are used to indicate location and size of construction components on architectural drawings			Expresses mathematical ideas and concepts orally and in writing [1.1.23]	
	7.4.3	Explain methods for applying dimensions and notes to various architectural features on construction drawings			Uses basic numerical concepts in practical situations [1.1.32]	
	7.4.4	Identify standard abbreviations used with dimensions on architectural drawings			Reading	Uses standard occupational resource materials [1.3.22]
	7.4.5	Explain procedures and line types used for dimensions, lines, and notes on architectural drawings			Speaking	Communicates a thought, idea, or fact in spoken form [1.5.5]
7.5 Select information using various architectural reference materials	7.5.1	Demonstrate use of a table of contents, indexes, cross-references, etc., in architectural reference materials	Foundation	Reading	Uses graphs/charts/tables to obtain factual information [1.3.21]	
	7.5.2	Research information in product manuals, drafting manuals, building code manuals, Sweets catalog, Thomas Register catalog, and graphic standards manuals			Uses standard occupational resource materials [1.3.22]	
	7.5.3	Reference construction information using Internet resources			Uses written resources (books, dictionaries, directories) to obtain factual information [1.3.23]	

## Unit 8: Preparing Floor Plan Drawings

### Hours: 20

Terminology: Fixture, Plumbing

<b>CAREER and TECHNICAL SKILLS</b>		<b>ACADEMIC and WORKPLACE SKILLS</b>			
What the Student Should be Able to Do		What the Instruction Should Reinforce			
Knowledge	Application	Skill Group	Skill	Description	
8.1 Define terminology related to floor plans	8.1.1 Use terms appropriately in context	Foundation	Reading	Applies/Understands technical words that pertain to architectural and computer-aided drafting [1.3.6]	
			Writing	Applies/Uses technical words and concepts [1.6.4]  Uses words appropriately [1.6.21]	
8.2 Outline information needed to develop a floor plan	8.2.1 Prepare a list of building considerations and desires for construction based on consumer desires and needs (include budget, family size and lifestyle, foot-traffic patterns, kitchen functionality requirements)	Thinking	Knowing how to Learn	Applies new knowledge and skills to architectural and computer-aided drafting [4.3.1]  Uses available resources to acquire new skills or improve skills [4.3.4]	
	8.2.2 Sketch a floor plan illustrating walls, windows, doors, kitchen and bathroom cabinets, major appliances, plumbing fixtures, etc., based on design considerations		Problem Solving	Comprehends ideas and concepts related to architectural and computer-aided drafting [4.4.1]  Interprets drawings to solve design problems [4.4.7]	
	8.2.3 Describe guidelines for applying various symbols for architectural features of a floor plan				
	8.2.4 Describe guidelines for placing dimensions on a floor plan drawing				

<b>CAREER and TECHNICAL SKILLS</b>		<b>ACADEMIC and WORKPLACE SKILLS</b>		
What the Student Should be Able to Do		What the Instruction Should Reinforce		
<b>Knowledge</b>	<b>Application</b>	<b>Skill Group</b>	<b>Skill</b>	<b>Description</b>
8.3 Outline the process to prepare a floor plan drawing	8.3.1 Use lines and symbols representing building features for a floor plan, including interior and exterior walls, windows, doors, kitchen and bathroom cabinets, major appliances, plumbing fixtures, and HVAC equipment	Foundation	Arithmetic/ Mathematics	Makes precision measurements using architectural and computer-aided drafting [1.1.27]
	8.3.2 Use guidelines for placing location dimensions and notes for building features on a floor plan of a residential structure		Speaking	Applies/Uses technical terms appropriate to audience [1.5.2]
		8.3.3 Show dimensions and notes for kitchen, bathroom, and other cabinets or millwork on a floor plan	Writing	Adapts notes to a proper form [1.6.1]
			Thinking	Decision-Making
	8.3.4 Use guidelines to place room names and general notes on a floor plan			
8.3.5 Distinguish among factors and considerations to locate stairs on a floor plan for a multi-story structure				

## Unit 9: Preparing Building Section Drawings

### Hours: 15

Terminology: Anchor, Base plate, Flashing, Joist, Rafter, Soffit, Stud

<b>CAREER and TECHNICAL SKILLS</b>		<b>ACADEMIC and WORKPLACE SKILLS</b>		
What the Student Should be Able to Do		What the Instruction Should Reinforce		
Knowledge	Application	Skill Group	Skill	Description
9.1 Define terminology related to the preparation of building section drawings	9.1.1 Use terms appropriately in context	Foundation	Reading	Applies/Understands technical words that pertain to architectural and computer-aided drafting [1.3.6]
			Writing	Applies/Uses technical words and concepts [1.6.4]  Uses words appropriately [1.6.21]

CAREER and TECHNICAL SKILLS			ACADEMIC and WORKPLACE SKILLS		
What the Student Should be Able to Do			What the Instruction Should Reinforce		
Knowledge	Application		Skill Group	Skill	Description
9.2 Describe procedures to develop a typical wall section drawing	9.2.1	Research building code guidelines for a local community	Foundation	Reading	Applies information and concepts derived from printed materials [1.3.3]
	9.2.2	Research and develop a list of building materials, sizes, and uses		Speaking	Asks questions to obtain information [1.5.4]  Organizes ideas, and communicates oral messages to listeners [1.5.7]
	9.2.3	Research and develop an understanding of building construction standards for foundations, floor framing, wall framing, ceiling and roof framing, cornice construction, and other details found on wall sections		Writing	Applies/Uses technical words and concepts [1.6.4]  Organizes information in an appropriate format [1.6.10]
	9.2.4	Research and prepare a sketch of wall section details	Thinking	Creative Thinking	Creates new design by applying specified criteria [4.1.3]
	9.2.5	Draw footing and foundation details typical of residential construction on a wall section		Decision Making	Generates options/alternatives [4.2.6]
	9.2.6	Show floor framing details typical of residential construction on a wall section			
	9.2.7	Prepare wall framing details typical of residential construction, including floor, wall, ceiling, roof, cornice and finished materials			

## Unit 10: Preparing Electrical Plan Drawings

### Hours: 15

Terminology: Amp, Circuit breaker, Convenience switch, Foot candle, Ground fault circuit interrupter (GFCI), Three-way switch

CAREER and TECHNICAL SKILLS What the Student Should be Able to Do		ACADEMIC and WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	Application	Skill Group	Skill	Description
10.1 Define terminology related to building electrical systems	10.1.1 Use terms appropriately in context	Foundation	Reading	Applies/Understands technical words that pertain to architectural and computer-aided drafting [1.3.6]
			Writing	Applies/Uses technical words and concepts [1.6.4]  Uses words appropriately [1.6.21]
10.2 Describe the process to develop an electrical plan drawing	10.2.1 Outline construction elements to be included on an electrical plan drawing	Foundation	Speaking	Asks questions to obtain information [1.5.4]  Organizes ideas, and communicates oral messages to listeners [1.5.7]
	10.2.2 Outline building codes and standards for the location of components of the electrical system and appliances in residential construction	Thinking	Creative Thinking	Creates new design by applying specified criteria [4.1.3]
	10.2.3 Identify factors that determine the location of electrical symbols, equipment symbols, distribution panel, HVAC, and other major components of an electrical system on an electrical plan drawing		Decision Making	Generates options/alternatives [4.2.6]

<b>CAREER and TECHNICAL SKILLS</b> What the Student Should be Able to Do		<b>ACADEMIC and WORKPLACE SKILLS</b> What the Instruction Should Reinforce		
<b>Knowledge</b>	<b>Application</b>	<b>Skill Group</b>	<b>Skill</b>	<b>Description</b>
10.3 Describe methods for preparing an electrical plan drawing	10.3.1 Give examples of the location of convenience and special purpose outlets on an electrical or floor plan  10.3.2 Use guidelines to sketch the layout of lighting for a residential electrical plan, indicating switch type, location, and device control  10.3.3 Use guidelines to place electrical symbols, equipment symbols, distribution panel, HVAC, and other major components on an electrical floor plan  10.3.4 Use guidelines to place lighting symbols on a residential electrical floor plan, indicating switch type and location  10.3.5 Use guidelines to place notes and symbols on electrical plan drawings	Thinking	Decision Making  Knowing how to Learn  Problem Solving	Demonstrates decision-making skills [4.2.4]  Locates appropriate learning resources to acquire or improve knowledge and skills [4.3.3]  Uses available resources to apply new skills [4.3.6]  Demonstrates logical reasoning in reaching a conclusion [4.4.2]

# Unit 11: Developing Building Elevations

**Hours: 10**

Terminology: Floor line, Grade line, Portico, Roofline, Shingle

<b>CAREER and TECHNICAL SKILLS</b>		<b>ACADEMIC and WORKPLACE SKILLS</b>		
What the Student Should be Able to Do		What the Instruction Should Reinforce		
Knowledge	Application	Skill Group	Skill	Description
11.1 Define terminology related to the development of building elevations	11.1.1 Use terms appropriately in context	Foundation	Reading	Applies/Understands technical words that pertain to architectural and computer-aided drafting [1.3.6]
			Writing	Applies/Uses technical words and concepts [1.6.4]  Uses words appropriately [1.6.21]
11.2 Identify elements of building elevation drawings	11.2.1 Distinguish among characteristics of various architectural styles, site considerations, and desired roof design to draw sketches of exterior building elevations  11.2.2 Consider consumer needs and tastes in selection of exterior finish materials  11.2.3 Demonstrate how to consult wall section, floor plan, and foundation plan to determine grade line, exterior details, heights of finished floor and ceiling, roof slope, and window and door appearance for preparing building elevations	Foundation	Reading	Analyzes and applies what has been read to specific task [1.3.2]
				Applies information and concepts derived from printed materials [1.3.3]
				Draws conclusions from what is read [1.3.12]

CAREER and TECHNICAL SKILLS What the Student Should be Able to Do		ACADEMIC and WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	Application	Skill Group	Skill	Description
11.3 Describe how to prepare building elevation drawings	11.3.1 Explain methods used to project horizontal dimensions of exterior walls, windows, doors, and other elements from a floor plan	Thinking	Creative Thinking	Uses imagination to create something new [4.1.1]
	11.3.2 Explain methods to project heights of grade lines, depth and thickness of footings, window and door heights, eave line, and roof height from wall section drawings		Knowing how to Learn	Applies new knowledge and skills to architectural and computer-aided drafting [4.3.1]
	11.3.3 Follow guidelines to place architectural details for windows, doors, railings, gables, and other exterior features on an elevation drawing		Problem Solving	Demonstrates logical reasoning in reaching a conclusion [4.4.2]
	11.3.4 Follow guidelines to place dimensions, symbols, and notes that identify the elevation, floor and ceiling levels, roof slope, grade lines, etc., on elevation drawings			

## Unit 12: Preparing a Career Portfolio

### Hours: 3

Terminology: Résumé, Work experience

<b>CAREER and TECHNICAL SKILLS</b>		<b>ACADEMIC and WORKPLACE SKILLS</b>		
What the Student Should be Able to Do		What the Instruction Should Reinforce		
Knowledge	Application	Skill Group	Skill	Description
12.1 Define terminology related to careers in architecture and architectural drafting	12.1.1 Prepare a written list of terms and definitions related to careers in architecture and architectural drafting	Foundation	Reading	Applies/Understands technical words that pertain to architectural and computer-aided drafting [1.3.6]
			Writing	Applies/Uses technical words and concepts [1.6.4]  Uses words appropriately [1.6.21]
12.2 Present a career portfolio	12.2.1 Evaluate the benefits of options for displaying drafting work in a professional manner  12.2.2 Utilize a variety of media and display materials, giving consideration to several portfolio display methods  12.2.3 Discuss the role a portfolio can play in the hiring process	Thinking	Creative Thinking	Develops visual aids to create audience interest [4.1.4]  Prepares presentation based on subject research, interviews, surveys [4.1.10]
			Seeing Things in the Mind's Eye	Organizes and processes images – symbols, pictures, graphs, objects, etc. [4.6.2]

CAREER and TECHNICAL SKILLS		ACADEMIC and WORKPLACE SKILLS			
What the Student Should be Able to Do		What the Instruction Should Reinforce			
Knowledge	Application	Skill Group	Skill	Description	
12.3 Select and organize material to create a career portfolio	12.3.1 Prepare a resume with cover letter, including references and letters of recommendation to be included with a career portfolio	Personal Management	Career Awareness, Development, and Mobility	Establishes and implements a plan of action [3.1.5]	
	12.3.2 Select examples of work for a career portfolio representing a variety of projects and demonstrating the range of talent (e.g., drawings, pictures of models)		Organizational Effectiveness	Presents personal skills as benefits for company objective [3.3.7]	
	12.3.3 Select work for a career portfolio that demonstrates ability and versatility	Thinking	Self-esteem	Develops self-confidence by creating a resume that promotes personal strengths/abilities [3.5.5]	
	12.3.4 Organize a career portfolio into sections labeled by subject areas		Problem Solving	Demonstrates logical reasoning in reaching a conclusion [4.4.2]	
	12.3.5 Develop an index for a career portfolio, including such items as architectural drawings, mechanical drawings, manual drawings, projects, awards, and recognitions (SkillsUSA, academic, and others)				
	12.3.6 Organize materials for a career portfolio in a logical manner for presentation				
12.4 Outline guidelines for presenting a career portfolio	12.4.1 Demonstrate professional dress for a portfolio presentation	Personal Management	Self-esteem	Creates self-confidence and positive self-image through proper grooming [3.5.3]	
	12.4.2 Demonstrate an understanding of oral communication skills necessary for presenting a portfolio	Thinking	Decision Making	Comprehends ideas and concepts related to architectural and computer-aided drafting [4.2.2]	
	12.4.3 Demonstrate various techniques for presenting work included in a portfolio				

## Unit 13: Career and Technical Student Organizations (SkillsUSA/HOSA)

**Hours: 12**

**Terminology:** Assess, Assessment, Behavior, Business meeting, Career, Competency, Critique, Cultural diversity, Customer, Equity issue, Expectation, Government, Image, Interview, Job application, Journal, Management, Mentor, Organizational chart, Parliamentary procedure, Portfolio, Presentation, Professional organization, Résumé, Self-motivation, Short-term goals, Stress, Task, Trade union

CAREER and TECHNICAL SKILLS			ACADEMIC and WORKPLACE SKILLS		
What the Student Should be Able to Do			What the Instruction Should Reinforce		
Knowledge	Application	Skill Group	Skill	Description	
13.1 Define terminology related to student organizations	13.1.1 Use terms appropriately in context	Foundation	Reading	Applies/Understands technical words that pertain to student organizations [1.3.6]	
			Writing	Applies/Uses technical words and concepts [1.6.4]  Uses words appropriately [1.6.21]	
13.2 Outline a self-assessment, and identify individual learning styles	13.2.1 Show individual strengths	Interpersonal	Leadership	Conveys attitudes and values of group to others [2.4.3]	
	13.2.2 Show areas in need of improvement	Thinking	Problem Solving	Identifies possible reasons for problem [4.4.6]	
13.3 Describe self-motivation techniques, and establish short-term goals	13.3.1 Prepare a list of short-term goals	Personal Management	Self-esteem	Develops/Initiates a plan for self-improvement [3.5.4]	
	13.3.2 Discuss ways to change or improve lifestyle, appearance, and behavior	Thinking	Creative Thinking	Identifies new goals and objectives [4.1.8]	
13.4 Give examples of individual time-management skills	13.4.1 Prepare and maintain a time journal	Foundation	Writing	Prepares a complex document in a concise manner [1.6.12]	
	13.4.2 Outline ways to improve time-management skills	Thinking	Problem Solving	Devises and implements a plan of action to resolve a problem [4.4.3]  Recognizes/Defines problem [4.4.8]	
13.5 Predict future occupations	13.5.1 Research the Internet to explore career opportunities in specified fields of study	Foundation	Reading	Draws conclusions from what is read [1.3.12]	
			Writing	Summarizes written information [1.6.17]	
	13.5.2 Prepare a presentation on a specified career area	Personal Management	Career Awareness, Development, and Mobility	Explores career opportunities [3.1.6]	
		Thinking	Creative Thinking	Prepares presentation based on subject research, interviews, surveys [4.1.10]	

CAREER and TECHNICAL SKILLS		ACADEMIC and WORKPLACE SKILLS			
What the Student Should be Able to Do		What the Instruction Should Reinforce			
Knowledge	Application	Skill Group	Skill	Description	
13.6 Identify the customer	13.6.1 Differentiate between external and internal customers	Interpersonal	Customer Service	Recognizes effects of positive/negative attitudes on customers [2.3.7]	
	13.6.2 Identify factors that contribute to poor customer relationships	Thinking	Decision Making	Shows initiative and courtesy in meeting and working with customers [2.3.8] Evaluates information/data to make best decision [4.2.5]	
13.7 Identify the benefits of doing a community service project	13.7.1 Outline ways to become involved in the community	Foundation	Speaking	Organizes ideas, and communicates oral messages to listeners [1.5.7]	
	13.7.2 Develop a community service project	Interpersonal	Teamwork	Contributes to group with ideas, suggestions, and effort [2.6.2]	
13.8 Describe effective communication with others	13.8.1 Note personal barriers to listening	Thinking	Problem Solving	Recognizes/Defines problem [4.4.8]	
	13.8.2 Relate a personal plan to overcome barriers to listening			Revises plan of action indicated by findings [4.4.9]	
13.9 Give locations for a shadowing activity	13.9.1 Summarize and relate an experience of job shadowing	Interpersonal	Leadership	Encourages/Motivates members of a group or team [2.4.6]	
13.10 Identify the components of an employment portfolio	13.10.1 Present parts of a portfolio	Foundation	Writing	Completes form accurately [1.6.7]	
	13.10.2 Compile a personal employment portfolio for an interview			Composes and creates documents – letters, manuals, reports, proposals, graphs, flow charts, etc. [1.6.8]	
13.11 List proficiency in program competencies	13.11.1 Construct an interpersonal competency assessment	Foundation	Writing	Analyzes data, summarizes results, and makes conclusions [1.6.2]	
13.12 Describe how to measure/modify short-term goals	13.12.1 Discuss how to pursue short-term goals	Thinking	Creative Thinking	Identifies new goals and objectives [4.1.8]	
13.13 Identify stress sources	13.13.1 Prepare a list of personal stress sources	Foundation	Writing	Communicates thoughts, ideas, or facts in written form in a clear, concise manner [1.6.6]	
	13.13.2 Outline techniques to cope with individual sources of stress	Thinking	Problem Solving	Demonstrates logical reasoning in reaching a conclusion [4.4.2]	

CAREER and TECHNICAL SKILLS		ACADEMIC and WORKPLACE SKILLS		
What the Student Should be Able to Do		What the Instruction Should Reinforce		
Knowledge	Application	Skill Group	Skill	Description
13.14 Identify characteristics of a positive image	13.14.1 List behaviors and traits that lead to a positive image  13.14.2 Note behaviors and traits that lead to a negative image	Foundation  Personal Management   Thinking	Reading  Self-esteem   Decision Making  Problem Solving	Determines what information is needed [1.3.10]  Comprehends the importance of a positive self-concept [3.5.1]  Develops/Initiates a plan for self-improvement [3.5.4]  Identifies pros and cons to assist in the decision-making process [4.2.7]  Demonstrates logical reasoning in reaching a conclusion [4.4.2]
13.15 Describe how team skills can be applied to a group project	13.15.1 Form a team to develop a class project	Interpersonal	Teamwork	Works effectively with others to reach a common goal [2.6.6]
13.16 Outline how to observe and critique a meeting	13.16.1 Attend a formal meeting held in the community  13.16.2 Prepare a critique of the meeting attended	Foundation  Interpersonal	Writing  Customer Service	Composes and creates documents – letters, manuals, reports, proposals, graphs, flow charts, etc. [1.6.8]  Shows initiative and courtesy in meeting and working with customers [2.3.8]
13.17 List business meeting skills	13.17.1 Relate the basic rules required to ensure an orderly and business-like meeting  13.17.2 Demonstrate with role-playing appropriate meeting skills	Foundation  Interpersonal	Speaking  Leadership	Organizes ideas, and communicates oral messages to listeners [1.5.7]  Conveys attitudes and values of group to others [2.4.3]  Influences group behavior [2.4.8]
13.18 Outline a survey for employment opportunities	13.18.1 Compile information on a particular employment opportunity of interest  13.18.2 Perform an Internet search of a specific career area	Foundation  Personal Management	Writing  Career Awareness, Development, and Mobility	Presents own opinion in written form in a clear, concise manner [1.6.14]  Develops skills to locate, evaluate, and interpret career information [3.1.4]
13.19 Select a professional journal for review and develop a three- to five-minute presentation	13.19.1 Prepare a presentation on the content, purpose, and distribution of a particular professional journal	Foundation	Writing	Prepares a complex document in a concise manner [1.6.12]

CAREER and TECHNICAL SKILLS		ACADEMIC and WORKPLACE SKILLS		
What the Student Should be Able to Do		What the Instruction Should Reinforce		
Knowledge	Application	Skill Group	Skill	Description
13.20 Identify customer expectations	13.20.1 List customer expectations  13.20.2 Discover the consequences of unmet customer expectations	Interpersonal	Customer Service	Applies human relations skills in real-life situations [2.3.1]  Recognizes effects of positive/negative attitudes on customers [2.3.7]  Works with customers to satisfy their expectations [2.3.9]
13.21 List parts of a job application	13.21.1 Prepare a job application from various businesses in the community  13.21.2 Demonstrate a mock job interview	Foundation	Reading  Speaking  Writing	Determines what information is needed [1.3.10]  Communicates a thought, idea, or fact in spoken form [1.5.5]  Uses verbal language and other cues, such as body language, appropriate in style, tone, and level of complexity to the audience and the occasion [1.5.14]  Completes form accurately [1.6.7]
13.22 Outline your employment portfolio	13.22.1 Construct a personal employment portfolio	Foundation	Writing	Composes and creates documents – letters, manuals, reports, proposals, graphs, flow charts, etc. [1.6.8]  Produces neat, legible document from typewriter or computer [1.6.15]  Summarizes written information [1.6.17]  Uses language, style, organization, and format appropriate to subject matter, purpose, and audience [1.6.19]
13.23 Identify supervisory and management roles in an organization	13.23.1 Prepare an organizational chart  13.23.2 Outline the responsibilities of managers and supervisors	Foundation  Interpersonal  Thinking	Writing  Leadership  Creative Thinking	Produces neat, legible document from typewriter or computer [1.6.15]  Helps an individual or group challenge existing procedures, policies, or authority [2.4.7]  Develops visual aids to create audience interest [4.1.4]

<b>CAREER and TECHNICAL SKILLS</b> What the Student Should be Able to Do		<b>ACADEMIC and WORKPLACE SKILLS</b> What the Instruction Should Reinforce		
<b>Knowledge</b>	<b>Application</b>	<b>Skill Group</b>	<b>Skill</b>	<b>Description</b>
13.24 Outline safety issues	13.24.1 Research safety issues in a given career area	Foundation	Reading	Identifies relevant details, facts, and specifications [1.3.16]
			Science	Follows safety guidelines [1.4.15]
		Personal Management	Integrity/Honesty/Work Ethic	Follows established rules, regulations, and policies [3.2.5]

## **Glossary**

### **Unit 1: Practicing Safety**

1. Hazard — danger; a chance of being injured or harmed
2. Shock — the sensation and reflex response of muscular spasm caused by an electric current passing through the body or a body part

## Unit 2: Preparing for a Career in Drafting

1. Architecture — the art and science of designing and erecting buildings
2. Career portfolio — represents an attempt to communicate ideas using words and pictures as well as the entire array of multimedia possibilities (sound, animation, net surfing, etc); a portable case for holding materials — such as photographs, drawings, or other materials — that represent a person's work

## Unit 3: Using Mathematics in Drafting

1. Board foot — a method of lumber measurement using nominal dimensions of 1" thick, 12" wide, and 12" long — or the equivalent
2. Coverage — the measure of the area to which building materials (i.e., shingles, siding, paint, etc.) have been applied or will be applied
3. Square foot — the measurement of an area equal to 144 square inches

## **Unit 4: Orientation to Architectural and Computer-Aided Drafting**

1. Architectural style — a method of design and construction
2. Scale — a measuring instrument used to draw objects at a reduced or enlarged size

## Unit 5: Performing Computer-Aided Drafting (CAD) Operations

1. AIA — abbreviation for American Institute of Architects, a national professional organization of architects and architectural professionals dedicated to improving the quality of the built environment
2. CAD — acronym for *computer-aided drafting*
3. Plotter — an output device used in computer-aided drafting to print hard copies of CAD files on various media, usually in a large format

## Unit 6: Orientation to Architectural Drafting

1. ADA — acronym for *Americans with Disabilities Act*
2. Frost line — the deepest level of frost penetration in soil; this depth varies in different climates; footings must be placed below the frost line to prevent a rupturing of the foundation
3. Vapor barrier — a membrane that retards the flow of moisture vapors and reduces condensation

## Unit 7: Performing Architectural Drafting Operations

1. Building code — legal requirements designed to protect the public by providing guidelines for structural, electrical, plumbing, and mechanical areas of a building
2. Building inspector — a hired official who is certified to inspect building construction to ensure that legal requirements designed to protect the public are enforced
3. Living area — areas of a home where the family relaxes, entertains guests, dines, and meets together

## Unit 8: Preparing Floor Plan Drawings

1. Fixture — something attached as a permanent appendage, apparatus, or appliance
2. Plumbing — the materials, fixtures, and piping system in a building that are connected to the sanitary drain or water supply

## Unit 9: Preparing Building Section Drawings

1. Anchors — devices, usually metal, used in building construction to secure one material to another
2. Base plate — the horizontal member at the bottom of a wall
3. Flashing — sheet metal or other material used in roof and wall construction to shed water away from areas of potential leakage
4. Joist — provides support for the floor
5. Rafter — the top structural member of a roof support system to which the decking or sheathing material is applied
6. Soffit — the underside of an overhanging cornice
7. Stud — a vertical wall framing member

## Unit 10: Preparing Electrical Plan Drawings

1. Amp — abbreviation for *ampere*; the unit of current used to measure the amount of electricity flowing through a conductor per unit of time
2. Circuit breaker — a protective device, in the form of a relay, that opens the circuit in case of an overload; a device that can open or close an electrical circuit
3. Convenience switch — a contact device attached to a circuit to allow electricity to be drawn off for appliances or lighting
4. Foot candle — a unit used to measure how much light reaches a surface; one lumen falling on 1 square foot produces 1 foot candle
5. Ground-fault circuit-interrupter (GFCI) — a device intended for the protection of personnel that functions to de-energize a circuit or portion thereof within an established period of time when a current to ground exceeds the values established for a Class A device
6. Three-way switch — a three-terminal switch manufactured in a manner that enables a pair of properly wired three-way switches to turn an electrical circuit on and off from two separate locations

## Unit 11: Developing Building Elevations

1. Floor line — a reference line on a building elevation drawing that represents the elevation of the floor after all underlayment and flooring materials have been installed
2. Grade line — the elevation where the soil surface strikes the building; the reference point for most elevation drawings
3. Portico — a covered entryway attached to a house, usually open on three sides, with the roof supported by columns or posts instead of walls
4. Roofline — the profile or silhouette made by a roof or series of roofs
5. Shingle — a thin oblong piece of material that is laid in overlapping rows to cover the roof or side of a house or other building

## Unit 12: Preparing a Career Portfolio

- 1 Résumé — a brief account of one's professional or work experience and qualifications often submitted with a job application
- 2 Work experience — the employment history of an individual

## Unit 13: Career and Technical Student Organizations (SkillsUSA/HOSA)

1. Assess — to determine the value, significance, or extent; to judge
2. Assessment — a tool used to determine value, significance, or extent
3. Behavior — the actions one takes; how one conducts oneself
4. Business meeting — planned gathering of individuals (occupational, work, trade, or organizational) that is methodical, systematic, and for a common purpose
5. Career — a chosen pursuit; the general course of progression of one's working life
6. Competency — the knowledge that enables one to comprehend and complete a task
7. Critique — a critical review or commentary
8. Cultural diversity — integrated existence of ethnic groups based on their values, beliefs, and behavior patterns (social, educational, economic, religious, and artistic values)
9. Customer — one who buys goods or services
10. Equity issue — a point of matter affecting the justice and fairness for all concerned
11. Expectation — eager anticipation; to look forward to the probable occurrence or appearance of something
12. Government — the agency or apparatus through which a governing individual or body functions and exercises authority
13. Image — the public's opinion or concept of something
14. Interview — a formal, in-person meeting in which the assessment of the qualifications of an applicant is determined
15. Job application — a form or document used by an employer when hiring prospective employees
16. Journal — a personal record of occurrences, experiences, or reflections kept on a regular basis
17. Management — the person or people who control or direct a business or other enterprise
18. Mentor — a wise or trusted counselor or teacher
19. Organizational chart — a chart that reflects the structure through which individuals cooperate systematically to conduct business
20. Parliamentary procedure — a body of rules governing a meeting

21. Portfolio — a portable case for holding materials — such as photographs, drawings, or other materials — that represent a person's work
22. Presentation — a performance; a formal introduction; the process of offering for consideration or display
23. Professional organization — a service provider utilizing a business relationship that allows outsourcing of human resources tasks, mainly for small to mid-sized businesses that do not have the need or resources for a dedicated human resources department; the concept is virtually unknown outside the United States
24. Résumé — a brief account of one's professional or work experience and qualifications often submitted with a job application
25. Self-motivation — to take action, move forward of one's own volition
26. Short-term goals — goals or targets that are reachable within a short period of time
27. Stress — an extreme pressure, strain, or difficulty
28. Task — a function to be performed
29. Trade union — a labor union, especially one limited in membership to people in the same trade