Knowledge	*Skills*	*Performance Element*	*Measurement Criteria*	**15.1301 Drafting and Design Technology, General (Architectural) (2011)**
I				**ACADEMIC FOUNDATIONS**
	A			**Demonstrate language arts knowledge and skills required to pursue the full range of post-secondary education and career opportunities.**
		1		Select and employ appropriate reading and communication strategies to learn and use technical concepts and vocabulary in practice.
		2		Demonstrate use of the concepts, strategies, and systems for obtaining and conveying ideas and information to enhance communication in the workplace.
		3		Locate, organize and reference written information from various sources to communicate with co-workers and clients/participants.
		4		Evaluate and use information resources to accomplish specific occupational tasks.
		5		Use correct grammar, punctuation and terminology to write and edit documents.
		6		Develop and deliver formal and informal presentations using appropriate media to engage and inform audiences.
		7		Interpret verbal and nonverbal cues/behaviors to enhance communication with co-workers and clients/participants.
	B			**Demonstrate mathematics knowledge and skills required to pursue the full range of post-secondary education and career opportunities.**
		1		Identify whole numbers, decimals, and fractions.
		2		Demonstrate knowledge of basic arithmetic operations such as addition, subtraction, multiplication, and division.
		3		Demonstrate use of relational expressions such as equal to, not equal, greater than, less than, etc.
		4		Apply data and measurements to solve a problem.
		5		Analyze Mathematical problem statements for missing and/or irrelevant data.
		6		Construct charts/tables/graphs from functions and data.
		7		Analyze data when interpreting operational documents.
		8		Perform algebraic operations
		9		Demonstrate knowledge of geometry
		10		Demonstrate knowledge of trigonometry
		11		Calculate weights, measurements, area, and volume
		12		Convert scales
		13		Convert survey measurements to architectural measurements
		14		Determine pitch, rise, run, and slope
	C			**Demonstrate science knowledge and skills required to pursue the full range of post-secondary and career education opportunities.**
		1		Evaluate scientific constructs including conclusions, conflicting data, controls, data, inferences, limitations, questions, sources of errors, and variables.
		2		Apply scientific methods in qualitative and quantitative analysis, data gathering, direct and indirect observation, predictions, and problem identification.
		3		Apply basic concepts of statics and loads to planning.
		4		Identify the physical properties present when using common construction materials in order to use the materials safely, effectively and efficiently.
	D			**Employ basic methods of data collection and analysis to provide information for projects.**
		1		Use available research methods when project planning and problem-solving.
		2		Provide appropriate precedents for development of a project.
II				**COMMUNICATIONS**
	A			**Develop and interpret tables, charts, and figures to support written and oral communications.**
		1		Create tables, charts, and figures to support written and oral communications.
		2		Interpret tables, charts, and figures used to support written and oral communication.
	B			**Apply active listening skills to obtain and clarify information.**
		1		Interpret a given verbal message/information.
		2		Respond with restatement and clarification techniques to clarify information.
		3		Model behaviors that demonstrate active listening.
	C			**Listen to and speak with diverse individuals to enhance communication skills.**
		1		Apply factors and strategies for communicating with a diverse workforce.
		2		Demonstrate ability to communicate and resolve conflicts within a diverse workforce.
	D			**Exhibit public relations skills to increase internal and external customer/client satisfaction.**
		1		Communicate effectively when developing positive customer/client relationships.
		2		Use correct grammar to communicate verbally.
		3		Listen to a presentation and record important information. Report back identifying central themes and use key points to explain how the message applies to a similar situation.
	E			**Use vocabulary and visual cues commonly used in design and construction to be successful in workplace/jobsite communications.**

Knowledge	Skills	Performance Element	Measurement Criteria	15.1301 Drafting and Design Technology, General (Architectural) (2011)
		1		Match vocabulary and visual cues to workplace/jobsite situations.
		2		Utilize vocabulary and visual cues in context of design and construction situations.
	F			**Use communication skills and strategies to work effectively with potential clients.**
		1		Deliver a presentation that explains a concept of design or preconstruction.
		2		Employ facilitation skills while leading meetings that involve a variety of clients and agencies.
III				**PROBLEM-SOLVING AND CRITICAL THINKING**
	A			**Solve problems using critical thinking skills (analyze, synthesize, and evaluate) independently and in teams. Solve problems using creativity and innovation.**
		1		Employ critical thinking skills independently and in teams to solve problems and make decisions (e.g., analyze, synthesize and evaluate).
		2		Employ critical thinking and interpersonal skills to resolve conflicts with staff and/or customers.
		3		Identify, write and monitor workplace performance goals to guide progress in assigned areas of responsibility and accountability.
		4		Conduct technical research to gather information necessary for decision-making.
		5		Create and implement project plans considering available resources and requirements of a project/problem to accomplish realistic planning in design and construction situations.
		6		Evaluate and adjust design and construction project plans and schedules to respond to unexpected events and conditions.
IV				**INFORMATION TECHNOLOGY APPLICATIONS**
	A			**Use Personal Information Management (PIM) applications to increase workplace efficiency.**
		1		Manage personal schedules and contact information.
		2		Create memos and notes.
	B			**Employ technological tools to expedite workflow.**
		1		Use information technology tools to manage and perform work responsibilities.
		2		Use email to share files and documents.
		3		Identify the functions and purpose of email systems.
		4		Use email to communicate within and across organizations.
		5		Access and navigate Internet (e.g., use a web browser).
		6		Search for information and resources.
		7		Evaluate Internet resources for reliability and validity.
		8		Prepare simple documents and other business communications.
		9		Prepare reports and other business communications by integrating graphics and other non-text elements.
		10		Prepare complex multi-media publications.
		11		Prepare presentations for training, sales and information sharing.
		12		Deliver presentations with supporting materials.
		13		Create a spreadsheet.
		14		Perform calculations and analyses on data using a spreadsheet.
		15		Manipulate data elements.
		16		Manage interrelated data elements.
		17		Analyze interrelated data elements.
		18		Generate reports showing interrelated data elements.
		19		Facilitate group work through management of shared schedule and contact information.
		20		Facilitate group work through management of shared files and online information.
		21		Facilitate group work through instant messaging or virtual meetings.
		22		Manage computer operations.
		23		Manage file storage.
		24		Compress or alter files.
		25		Operate computer driven equipment and machines.
		26		Use installation and operation manuals.
		27		Troubleshoot computer driven equipment and machines.
		28		Access support as needed to maintain operation of computer driven equipment and machines.
	C			**Demonstrate Digital Citizenship**
		1		Identify legal and ethical issues related to the use of information and communication technologies (e.g., properly selecting and citing resources)
		2		Discuss possible long-range effects of unethical uses of technology (e.g., virus spreading, file pirating, hacking) on cultures and society
		3		Discuss and demonstrate proper netiquette in online communications
		4		Identify ways that individuals can protect their technology systems from unethical or unscrupulous users
		5		Create appropriate citations for resources when presenting research findings

Knowledge	Skills	Performance Element	Measurement Criteria	15.1301 Drafting and Design Technology, General (Architectural) (2011)
		6		Discuss and adhere to fair use policies and copyright guidelines
V				**SYSTEMS**
	A			**Describe the nature and types of business organizations to build an understanding of the scope of organizations.**
		1		Describe the types and functions of businesses.
		2		Explain the functions and interactions of common departments within a business.
	B			**Implement quality control systems and practices to ensure quality products and services.**
		1		Describe quality control standards and practices common to the workplace.
		2		Diagnose and make necessary corrections or improvements to a technical system in a business, industry, or simulated work place setting.
	C			**Comply with regulations and applicable codes to establish a legal and safe workplace/jobsite.**
		1		Identify governmental regulations and national, state and/or local building codes that apply to a given workplace/jobsite.
		2		Identify workplace/jobsite environmental hazards of a given situation.
		3		Describe how relationships between trades/professions can facilitate smooth workflow and outcome to meet project goals.
	D			**Examine all factors effecting the project and the planning process.**
		1		Understand social, environmental and political factors that affect the project.
		2		Understand the context of the projects.
		3		Explain the relationship of traditional project phases and the various roles within them to a current project.
	E			**Understand and manage union-management relationships and contracts to create a cooperative work environment.**
		1		Analyze a proposed contract in terms of the company's position and union's position in labor contract negotiations.
		2		Assess a situation for compliance with terms of a contract.
	F			**Integrate structural, environmental, safety, building envelopes and building service systems to design and construct buildings and structures.**
		1		Describe building systems and their interrelationships.
		2		Develop design criteria for building systems in a given scenario.
VI				**SAFETY, HEALTH AND ENVIRONMENTAL**
	A			**Implement personal and jobsite safety rules and regulations to maintain safe and healthful working conditions and environments.**
		1		Assess workplace conditions with regard to safety and health.
		2		Select appropriate personal protective equipment as needed for a safe workplace/jobsite.
		3		Employ a safety hierarchy and communication system within the workplace/jobsite.
		4		Implement safety precautions to maintain a safe worksite.
	B			**Complete work tasks in accordance with employee rights and responsibilities and employers obligations to maintain workplace safety and health.**
		1		Identify rules and laws designed to promote safety and health in the workplace.
		2		State the rationale of rules and laws designed to promote safety and health.
	C			**Employ emergency procedures as necessary to provide aid in workplace accidents.**
		1		Use knowledge of First Aid procedures as necessary.
		2		Use knowledge of CPR procedures as necessary.
		3		Use safety equipment as necessary.
	D			**Employ knowledge of response techniques to create a disaster and/or emergency response plan.**
		1		Complete an assessment of an emergency and/or disaster situation.
		2		Create an emergency and/or disaster plan.
	E			**Apply the suitable practices of environmental impact to enhance project acceptance and quality.**
		1		Evaluate the sustainable design elements of a given project.
		2		Align sustainable design elements of a given project.
	F			**Apply objective construction guidelines for the accommodation of people with varying physical abilities to meet accessibility requirements.**
		1		Explain how the Americans with Disabilities Act influences the compliance requirements for project designs.

Knowledge	*Skills*	*Performance Element*	*Measurement Criteria*	**15.1301 Drafting and Design Technology, General (Architectural) (2011)**
		2		Design project plans that comply with OSHA standards.
VII				**LEADERSHIP AND TEAMWORK**
	A			**Use leadership and teamwork skills in collaborating with others to accomplish organizational goals and objectives.**
		1		Employ leadership skills to accomplish organizational goals and objectives.
		2		Employ organizational and staff development skills to foster positive working relationships and accomplish organizational goals.
		3		Employ teamwork skills to achieve collective goals and use team members' talents effectively.
		4		Establish and maintain effective working relationships with all levels of personnel and other departments in order to accomplish objectives and tasks.
		5		Conduct and participate in meetings to accomplish work tasks.
		6		Employ mentoring skills to inspire and teach others.
	B			**Appreciate the diversity of needs, values and social patterns in project design to appropriately meet client needs.**
		1		Identify the geographic and cultural issues related to project design in a given situation.
		2		Participate in appropriate trade and professional associations.
VIII				**ETHICS AND LEGAL RESPONSIBILITIES**
	A			**Know and understand the importance of professional ethics and legal responsibilities.**
		1		Apply ethical reasoning to a variety of workplace situations in order to make ethical decisions.
		2		Interpret and explain written organizational policies and procedures to help employees perform their jobs according to employer rules and expectations.
		3		Read regulations and contracts to ensure ethical and safety elements are observed.
		4		Use ethical and legal standards to avoid conflicts of interest in a design and/or construction setting.
IX				**EMPLOYABILITY AND CAREER DEVELOPMENT**
	A			**Know and understand the importance of employability skills.**
		1		Identify and demonstrate positive work behaviors and personal qualities needed to be employable.
		2		Manage resources in relation to the position (i.e. budget, supplies, computer, etc).
		3		Explain written organizational policies, rules and procedures common in design and construction settings to help employees perform their jobs.
	B			**Explore, plan, and effectively manage careers.**
		1		Develop a personal career plan to meet career goals and objectives.
		2		Identify and explore career opportunities in one or more career pathways to build an understanding of the opportunities available in the cluster.
		3		Recognize and act upon requirements for career advancement to plan for continuing education and training.
		4		Continue professional development to keep current on relevant trends and information within the industry.
		5		Examine licensing, certification and credentialing requirements at the national, state and local levels to maintain compliance with industry requirements.
		6		Examine employment opportunities in entrepreneurship to consider entrepreneurship as an option for career planning.
	C			**Demonstrate skills related to seeking and applying for employment to find and obtain a desired job.**
		1		Use multiple resources to locate job opportunities.
		2		Prepare a résumé.
		3		Prepare a letter of application.
		4		Complete an employment application.
		5		Interview for employment.
		6		List the standards and qualifications that must be met in order to enter a given industry.
		7		Employ critical thinking and decision-making skills to exhibit qualifications to a potential employer.
		8		Maintain a career portfolio to document knowledge, skills and experience in a career field.
		9		Demonstrate skills in evaluating and comparing employment opportunities in order to accept employment positions that match career goals.
		10		Identify and exhibit traits for retaining employment to maintain employment once secured.
X				**TECHNICAL SKILLS**
	A			**Employ information management techniques and strategies in the workplace to assist in decision-making.**
		1		Use information literacy skills when accessing, evaluating and disseminating information.
		2		Describe the nature and scope of information management.

Knowledge	Skills	Performance Element	Measurement Criteria	**15.1301 Drafting and Design Technology, General (Architectural) (2011)**
		3		Maintain records to facilitate ongoing business operations.
	B			**Employ planning and time management skills and tools to enhance results and complete work tasks.**
		1		Develop goals and objectives.
		2		Prioritize tasks to be completed.
		3		Develop timelines using time management knowledge and skills.
		4		Use project-management skills to improve workflow and minimize costs.
	C			**Read, interpret, and use technical drawings, documents, and specifications to plan a project.**
		1		Interpret drawings used in project planning.
		2		Describe written standards and that specifications that apply.
		3		Recognize how specifications and standards are arranged for proper access.
		4		Use architect's plan, manufacturer's illustrations and other materials to communicate specific data and visualize proposed work.
	D			**Use and maintain appropriate tools, machinery, equipment, and resources to accomplish project goals.**
		1		Select tools, machinery, equipment, and resources that match requirements of the job.
		2		Identify sources of information concerning state-of-the-art tools, equipment, materials, technologies and methodologies.
		3		Demonstrate use of tools, machinery, equipment and other resources commonly used in design and construction.
	E			**Develop technical drawings drafted by hand and computer-generated plans to design structures.**
		1		Identify client requirements.
		2		Use communication skills and strategies to work effectively with people (including clients, team members, and others).
		3		Draw and sketch by hand to communicate ideas effectively.
		4		Learn to read and produce technical drawings, understanding the significance of each line in a drawing.
	F			**Employ appropriate representational media to communicate concepts and design.**
		1		Convey graphic information using multi-dimensional drawings.
		2		Build models using referenced drawings and sketches.
		3		Utilize computer technology when communicating concepts and designs.
	G			**Employ principles, conventions, standards, applications and restrictions pertaining to the manufacture and use of construction materials, components and assemblies to incorporate into project design.**
		1		Select building materials and assemblies upon evaluation that meet project specifications.
		2		Use appropriate combinations of building materials and components that satisfy the requirements of building programs.
	H			**Apply basic organizational, spatial, structural and constructional principles to the design of interior and exterior space so that design plans are effective.**
		1		Develop design alternatives that address a given problem.
	I			**Preparing to Draw; Basic Drawing and Dimensioning Skills**
		1		Identify drafting tools, materials, and equipment (including CAD)
		2		Differentiate and select drafting media
		3		Identify and select paper sizes and determine scale
		4		Identify various line types
		5		Draw and modify lines
		6		Measure lines and angles
		7		Use acceptable lettering techniques
		8		Place dimensions and local/general notes
	J			**Geometric Construction**
		1		Construct geometric elements
		2		Divide geometric elements
		3		Construct perpendicular lines
		4		Construct tangent lines and arcs
		5		Transfer an angle
	K			**Drawing Techniques; Supplementary Views**
		1		Identify pictorial drawings (i.e., isometric, oblique, perspective and presentation)
		2		Demonstrate knowledge of schematic drawings
		3		Demonstrate knowledge of orthographic drawings
		4		Draw and identify auxiliary views
		5		Indicate point of material installation
	L			**Planning**
		1		Examine space relationships
		2		Analyze site considerations

15.1301 Drafting and Design Technology, General (Architectural) (2011)

Knowledge	*Skills*	*Performance Element*	*Measurement Criteria*	
		3		Identify building styles
		4		Determine client needs
		5		Incorporate building codes
		6		Identify construction material properties and uses
	M			**Architectural Drawing Types**
		1		Identify architectural terms and symbols
		2		Identify and develop roof styles
		3		Identify and develop floor plans
		4		Develop basement and foundation plans
		5		Identify kitchen and bath arrangements
		6		Develop interior and exterior elevations
		7		Develop a building section
		8		Develop a wall section
		9		Draw architectural details
	N			**Site Plans**
		1		Draw and dimension site and plot plans
		2		Develop landscape plan
		3		Interpret contours and topographical profiles
		4		Identify setbacks
		5		Identify utilities
	O			**Structural Drawings**
		1		Draw structural details
		2		Draw framing plan
		3		Analyze structural systems
	P			**Mechanical and Electrical Systems**
		1		Identify and apply electrical terms, symbols, and systems
		2		Identify and apply plumbing terms, symbols, and systems
		3		Identify and apply HVAC terms, symbols, and systems
	Q			**Supplemental Drafting Activities**
		1		Draw cover sheet and title block information
		2		Develop schedules
		3		Use reference sources
		4		Arrange and coordinate drawings
		5		Revise drawings
		6		Create a bill of materials
	R			**Specifications**
		1		Assist in developing a project manual
		2		Describe responsibilities of related parties (i.e., design professional, client, and contractor)
		3		Identify component and material specifications
XI				Deign / Pre-Construction Pathway (Consolidated into knowledge areas of I - X)