Architecture and Construction Career Cluster

1. Use vocabulary, symbols, and formulas commonly used in design and construction.

AC 1.1: Match vocabulary and visual cues to workplace/jobsite situations.
Sample Indicators:

- *Use correct terminology to convey verbal and visual.*

AC 1.2: Utilize vocabulary and visual cues in context of design and construction situations.
Sample Indicators:

- *Confirm understanding of verbal and visual instructions.*
- *Ask questions concerning details of instructions.*
- *Perform assignments as requested.*

2. Use architecture and construction skills to create and manage a project.

AC 2.1: Manage the schedule of a project/job.
Sample Indicators:

- *Identify timeline required to complete a project/job.*
- *Evaluate efficiency and effectiveness of a project/job.*
- *Adjust project plans to reflect an unexpected change.*

AC 2.2: Estimate resources/materials required for a specific project or problem.
Sample Indicators:

- *Estimate correct amount of required resources/materials.*
- *Create a budget.*

AC 2.3: Use available resources/materials effectively while completing a project or resolving a problem with a project plan.
Sample Indicators:

- *Evaluate waste of resources/materials.*
- *Evaluate necessity for additional resources/materials.*

AC 2.4: Determine alternative solutions for a specific project/problem.
Sample Indicators:

- *Evaluate feasibility of alternative suggestions.*
- *Implement appropriate alternatives.*

AC 2.5: Plan, organize, schedule, and manage a project/job to optimize workflow and outcome.
Sample Indicators:

- *Report results of the project/job.*

3. Comply with regulations and applicable codes to establish and manage a legal and safe workplace/jobsite.

AC 3.1: Evaluate workplace/jobsite activities for compliance with governmental and other applicable safety regulations such as EPA and OSHA.
Sample Indicators:

- *Read and discuss information on OSHA, EPA, and other safety regulations.*
- *Pass safety inspections and comply with regulations at all times.*

AC 3.2: Identify workplace/jobsite environmental hazards of a given situation.
Sample Indicators:

- *Follow safe practices relating to environmental hazards.*
- *Identify workplace hazards common to design and construction situations.*

AC 3.3: Identify governmental regulations and national, state, and/or local building codes that apply to a given workplace/jobsite.
Sample Indicators:

- *Follow governmental regulations and building codes.*
- *Follow industry regulations and building codes.*
- *Follow jurisdictional regulations and building codes.*
- *Use information given in regulations and codes correctly.*
- *Pass job inspections and comply with regulations at all times.*
- *Pass required substance abuse screening.*

AC 3.4: Use MSDS (Material Safety Data Sheets) information for the management, use, and disposal of materials.
Sample Indicators:

- *Obtain, understand, and follow MSDS (Material Safety Data Sheets) information.*
- *Use materials safely.*

4. Understand the nature and scope of the Architecture & Construction Cluster and the role architecture and construction play in society and the economy.

AC 4.1: Describe how relationships between trades/professions can facilitate smooth workflow and outcome to meet project goals.
Sample Indicators:

- *Coordinate work between trades.*

AC 4.2: Explain how the hierarchy of roles on a jobsite facilitates smooth workflow and outcome to meet project goals.
Sample Indicators:

- *Incorporate job functions in the reporting chain of supervision.*
- *Evaluate the safety issues and responsibilities managed by each level of supervision.*

5. Understand the roles and responsibilities among trades and professions including labor/management relationships.

AC 5.1: Analyze a proposed contract in terms of the company's position and union's position in labor contract negotiations.
Sample Indicators:

- *Document how quality improves profitability.*
- *Report on issues that affect quality.*

AC 5.2: Assess a situation for compliance with terms of a contract.
Sample Indicators:

- *No Sample Indicators.*

AC 5.3: Discuss the role and responsibilities among the trades/professions in the work environment.
Sample Indicators:

- *No Sample Indicators.*

6. Read, interpret, and use technical drawings, documents and specifications to plan a project.

AC 6.1: Interpret drawings used in project planning.
Sample Indicators:

- *Recognize elements and symbols of blueprints and drawings.*

AC 6.2: Recognize how specifications and standards are arranged for proper access.
Sample Indicators:

- *Use specifications and standards.*
- *Apply specifications and standards appropriately.*

AC 6.3: Use architect's plan, manufacturer's illustrations and other materials to communicate specific data and visualize proposed work.
Sample Indicators:

- *Sketch/draw/illustrate concepts and ideas.*
- *Draw or sketch plan/layout to be completed.*
- *Use proper measurements to determine layout.*

AC 6.4: Describe the written standards and specifications that apply.
Sample Indicators:

- *Interpret and explain standards and specifications.*

7. Evaluate a wide range of career pathway opportunities for success in architecture and construction careers.

AC 7.1: Research and match career opportunities based upon their fit with personal career goals.
Sample Indicators:

- *Locate and interpret career information for at least one career pathway within the cluster.*
- *Identify job requirements for the career cluster/pathway.*
- *Identify educational and credentialing requirements for careers within the cluster.*

AC 7.2: Match personal interests and aptitudes to careers when researching opportunities within the pathways.
Sample Indicators:

- *Identify personal interests and aptitudes.*
- *Identify job requirements and characteristics for selected careers.*
- *Compare personal interests and aptitudes with job requirements and characteristics of the career selected.*
- *Modify career goals based on results of personal interests and aptitudes with career requirements and characteristics.*

AC 7.3: Develop a career plan for advancement in architecture and construction careers
Sample Indicators:

- *No sample indicators*

Construction Pathway (AC-CST)

1. Understand contractual relations with all parties involved in the building process to ensure successful build of a project.

AC-CST 1.1: Establish/implement reporting relationships among stakeholders.
Sample Indicators:

- *No sample indicators*

AC-CST 1.2: Create sustainable and accountable partnerships between stakeholders.
Sample Indicators:

- *No sample indicators*

AC-CST 1.3: Describe the contracting process to include contract development, the bid process, payment terms, planning approvals, and limitations of liability.
Sample Indicators:

- *No sample indicators*

AC-CST 1.4: Describe the role that each stakeholder will assume to ensure successful completion of the project.

Sample Indicators:

- *No sample indicators*

2. Understand approval procedures to ensure effective flow of information in the construction process.

AC-CST 2.1: Identify the components necessary for developing submittal approval procedures system.
Sample Indicators:

- *No sample indicators*

AC-CST 2.2: Employ procedures that complete submittal approval process related to shop drawings.
Sample Indicators:

- *No sample indicators*

AC-CST 2.3: Employ procedures that complete submittal approval process related to state and local permits.
Sample Indicators:

- *No sample indicators*

3. Understand and implement testing and inspection procedures to ensure successful completion of a construction project.

AC-CST 3.1: List testing and inspection procedures related to specific areas.
Sample Indicators:

- *No sample indicators*

AC-CST 3.2: Interpret guides designed for testing and inspection purposes in specific areas.
Sample Indicators:

- *No sample indicators*

AC-CST 3.3: Explain the benefits of using an external contractor to conduct the testing and inspection on the different phases of a build project.
Sample Indicators:

- *No sample indicators*

4. Understand the purpose of scheduling as it relates to the successful completion of a construction project.

AC-CST 4.1: Develop a schedule for a specific project.
Sample Indicators:

- *No sample indicators*

AC-CST 4.2: Explain rationale for a specific scheduling procedure.
Sample Indicators:

- *No sample indicators*

AC-CST 4.3: Describe the relationship between scheduling, risk assessment, and cost estimating to the success of the project.
Sample Indicators:

- *No sample indicators*

5. Understand and apply practices and procedures required to maintain jobsite safety.

AC-CST 5.1: Determine procedures for a jobsite safety program.
Sample Indicators:

- *Incorporate the procedures into the design of a safety program.*

AC-CST 5.2: Explain the importance of workers being OSHA-certified.
Sample Indicators:

- *No Sample Indicators.*

AC-CST 5.3: Identify universal signs and symbols, such as colors, flags, stakes, and hand signals that apply to construction worksite situations.
Sample Indicators:

- *Explain functions of signs and symbols.*
- *Inspect all signs and symbols for safe and proper use.*

AC-CST 5.4: Explain the need for jobsite security to prevent liability
Sample Indicators:

- *No Sample Indicators*

AC-CST 5.5: Determine the components necessary to ensure environmental safety on the jobsite.
Sample Indicators:

- *No Sample Indicators*

6. Manage relationships with internal and external parties to successfully complete construction projects.

AC-CST 6.1: Describe strategies used to promote collaboration, trust and clear communication among contractors, suppliers, clients and others on a jobsite.
Sample Indicators:

- *No Sample Indicators*

7. Compare and contrast the building systems and components.

AC-CST 7.1: Identify building systems needed t complete a construction project.
Sample Indicators:

- *List all building systems involved in a project.*
- *Describe the purpose of each system.*
- *List all components of the involved building system.*
- *Describe the function of each component.*

AC-CST 7.2: Identify components of building systems needed to complete a project.
Sample Indicators:

- *No Sample Indicators.*

AC-CST 7.3: Incorporate appropriate building systems into a construction project
Sample Indicators:

- *No Sample Indicators.*

8. Demonstrate the construction crafts required for each phase of a given project.

AC-CST 8.1: Utilize skills to maintain tools, machinery, equipment and construction resources.
Sample Indicators:

- *No Sample Indicators.*

9. Safely use and maintain appropriate tools, machinery, equipment, and resources to accomplish construction project goals.

AC-CST 9.1: Select tools, machinery, equipment, and supplies that match project requirements.
Sample Indicators:

- *Use tools, machinery, and equipment according to industry standards.*
- *Properly maintain tools, machines, and equipment in a safe manner.*

AC-CST 9.2: Identify sources of information about state-of-the-art tools, machinery, equipment, materials, construction technologies.
Sample Indicators:

- *No Sample Indicators.*

AC-CST 9.3: Demonstrate use of tools, machinery, equipment, and other resources commonly used in design and construction.
Sample Indicators:

- *No Sample Indicators.*

Design/Pre-Construction Pathway (AC-DES)

1. Justify design solutions through the use of research documentation and analysis of data.

AC-DES 1.1: Use available research methods when project planning and problem-solving.
Sample Indicators:

- *Select and employ the proper method for a given project.*

AC-DES 1.2: Provide appropriate precedents for development of a project.
Sample Indicators:

- *Articulate logical rationale for use of chosen precedents.*

AC-DES 1.3: Utilize the ability to locate, organize, analyze, apply, and communicate information from multiple sources and perspectives.
Sample Indicators:

- *No Sample Indicators.*

2. Use effective communication skills and strategies (listening, speaking, reading, writing, and graphic communications) to work with clients and colleagues.

AC-DES 2.1: Employ facilitation skills while leading meetings that involve a variety of clients and agencies.
Sample Indicators:

- *Identify types of client/agency needs.*
- *Mediate diversity to meet needs.*

AC-DES 2.2: Employ appropriate representational media to communicate concepts and design.
Sample Indicators:

- *Deliver a presentation that explains a concept of design or preconstruction.*
- *Show project plans for visual impact.*
- *Evaluate customer comprehension.*

3. Understand the integral systems that impact the design of buildings and structures.

AC-DES 3.1: Describe building systems and their interrelationships.
Sample Indicators:

- *Select and integrate building systems.*

AC-DES 3.2: Develop design criteria for building systems in a given scenario.
Sample Indicators:

- *No Sample Indicators*

AC-DES 3.3: Evaluate primary building systems including structure, structural engineering concepts, and environmental systems that are integrated within the building project.
Sample Indicators:

- *No Sample Indicators*

AC-DES 3.4: Apply suitable practices of environmental impact to enhance project acceptance and quality.
Sample Indicators:

- *Integrate sustainable design principles across planning, design, and construction*

4. Apply building code, laws, and rules in the design and construction of projects.

AC-DES 4.1: Explain how the Americans with Disabilities Act influences the compliance requirements for project designs.
Sample Indicators:

- *Integrate Americans with Disabilities Act compliance into project designs.*

AC-DES 4.2: Design project plans that comply with OSHA standards.
Sample Indicators:

- *Demonstrate comprehensive knowledge and application of OSHA Standards.*

5. Identify the diversity of needs, values, and social patterns in project design, including accessibility standards, to appropriately meet client needs.

AC-DES 5.1: Identify the geographic and cultural issues related to project design in a given situation.
Sample Indicators:

- *Apply cultural traditions and diversity to project design.*

AC-DES 5.2: Participate in appropriate trade and professional associations.
Sample Indicators:

- *No Sample Indicators.*

AC-DES 5.3: Identify the diverse roles that utilize individual talents when working as members of a team.
Sample Indicators:

- *No Sample Indicators.*

6. Apply the techniques and skills of modern drafting, design, engineering, and construction to projects.

AC-DES 6.1: Apply basic organizational, spatial, structural, and constructional principles to the design of interior and exterior space to produce an effective design.
Sample Indicators:

- *Develop design alternatives that address a given problem.*
- *Evaluate and select the best solution.*

AC-DES 6.2: Read and produce technical drawings, understanding the significance of each line in a drawing.
Sample Indicators:

- *No Sample Indicators.*

AC-DES 6.3: Use communication skills and strategies to work effectively with people (including clients, team members, and others) to identify design/construction requirements.
Sample Indicators:

- *Develop technical drawings drafted by hand and computer-generated plans to design structures that meet the client's specifications.*
- *Draw and sketch by hand to communicate ideas effectively.*

7. Employ appropriate representational media to communicate concepts and design.

AC-DES 7.1: Convey graphic information using multi-dimensional drawings.
Sample Indicators:

- *Employ basic drawing skills.*
- *Conceptualize a three-dimensional form from a two-dimensional drawing to visualize proposed work.*
- *Build three-dimensional form models.*

AC-DES 7.2: Build models using referenced drawings and sketches.
Sample Indicators:

- *Employ basic model building techniques.*
- *Verify accuracy of model based on drawings and sketches used.*

AC-DES 7.3: Utilize computer technology when communicating concepts and designs.
Sample Indicators:

- *Employ basic computer modeling techniques.*

8. Apply principles, conventions, standards, applications, and restrictions pertaining to the selection and use of construction materials, components and assemblies for project design.

AC-DES 8.1: Select building materials and assemblies upon evaluation that meet project specifications.
Sample Indicators:

- *Develop and communicate an assigned building assembly.*
- *Apply mathematical skills to estimate the cost of the materials and supplies.*

AC-DES 8.2: Use appropriate combinations of building materials and components that satisfy the requirements of building programs.
Sample Indicators:

- *Select the more appropriate building assembly.*

Maintenance/Operation Pathway (AC-MO)

1. Recognize and employ universal construction signs and symbols to function safely in the work place.

AC-MO 1.1: Select the most appropriate sign or symbol to use upon analysis of a given workplace situation.
Sample Indicators:

- *No Sample Indicators*

AC-MO 1.2: Identify universal signs and symbols such as colors, flags, stakes, and hand signals that apply to construction workplace situations.
Sample Indicators:

- *Explain functions of signs and symbols.*
- *Work safely using signs and symbols.*
- *Inspect all signs and symbols for safe and proper use.*
- *Use proper signs and symbols for the work area.*

2. Use troubleshooting procedures hen solving a maintenance problem to maintain buildings and structures.

AC-MO 2.1: Isolate a maintenance problem using troubleshooting procedures.
Sample Indicators:

- *Identify the problem using at least one appropriate troubleshooting method.*
- *Communicate problem and course of action to others.*

AC-MO 2.2: Select a solution that addresses an identified maintenance problem.
Sample Indicators:

- *Identify strategies for implementing the solution.*
- *Identify tools and equipment needed.*

AC-MO 2.3: Implement a solution using required strategies, tools, and equipment.
Sample Indicators:

- *Use tools and equipment safely, effectively, and efficiently.*
- *Test and verify that the problem is solved.*

3. Apply construction skills when repairing, restoring or renovating existing structures.

AC-MO 3.1: Determine materials required to complete restoration.
Sample Indicators:
- *Match materials selected to the restoration specifications.*

AC-MO 3.2: Implement strategies that produce a restored structure.
Sample Indicators:
- *Restore structure to match original structure within specifications.*

AC-MO 3.3: Develop solutions to restoration problems upon evaluation.
Sample Indicators:
- *Identify strategies for implementing solutions.*

4. Determine work required to repair or renovate an existing building or structure.

AC-MO 4.1: Complete required repair work that restores project to original condition.
Sample Indicators:
- *Use tools and materials safely, effectively, and efficiently*
- *Test and verify that the repair is complete.*

AC-MO 4.2: Apply evaluation strategies that assess the extent and condition of a structural problem.
Sample Indicators:
- *Identify potential sources of problems.*
- *Select the most probable cause of each problem.*

AC-MO 4.3: Identify tools, materials, and human resources needed to repair work.
Sample Indicators:
- *Select tools and materials that will repair the problem effectively and efficiently.*
- *Employ individuals with the appropriate expertise to complete the repair work.*

5. Plan and practice preventative maintenance activities to service existing structures.

AC-MO 5.1: Develop a checklist to track preventative maintenance.
Sample Indicators:
- *Read and interpret technical manuals.*
- *Identify preventative maintenance needs for a variety of conditions.*
- *List maintenance needs for a variety of equipment, systems, and structures.*

AC-MO 5.2: Identify tools and materials needed to perform preventative maintenance.
Sample Indicators:
- *Select and use tools and materials safely, effectively, and efficiently.*

AC-MO 5.3: Establish time-based schedules to perform preventative maintenance.
Sample Indicators:

- *Follow a maintenance schedule.*
- *Complete and maintain preventative maintenance records.*

6. Maintain and inspect building systems to achieve safe and efficient operation of facilities.

AC-MO 6.1: Use maintenance and inspection strategies on fire prevention, HBAX, security/alarm, environmental, and process systems according to safety, code, and customer requirements.
Sample Indicators:

- *Read and interpret technical manuals.*
- *Apply information from technical manuals.*

AC-MO 6.2: Describe the processes/procedures used to maintain facility operation systems.
Sample Indicators:

- *No Sample Indicators.*

AC-MO 6.3: Participate in appropriate training activities to learn new or improved maintenance/operations strategies.
Sample Indicators:

- *No Sample Indicators.*