Standards/Measurement Criteria
Construction Technologies
Construction Technology - Option A
CIP No. 46.0400

***This indicates the "technical skill standards" for this program that will be assessed on the end-of-program Construction Technologies standards assessment.**

1.0 CONDUCT A CAREER SURVEY OF THE CONSTRUCTION TECHNOLOGIES INDUSTRY

1.1 Identify work activities associated with career pathways in construction technologies
1.2 Relate interests, skills and personal orientation to career choices in construction technologies
1.3 Relate interests, skills and personal orientation to job success in construction technologies

2.0 DEVELOP JOB SEARCH SKILLS NECESSARY TO OBTAIN EMPLOYMENT IN THE CONSTRUCTION TECHNOLOGIES INDUSTRY

2.1 Explain the steps in a job search
2.2 Identify employment opportunities in construction technologies
2.3 Critique a job application

3.0 PARTICIPATE IN LEADERSHIP ACTIVITIES SUCH AS THOSE SUPPORTED BY CAREER AND TECHNICAL STUDENT ORGANIZATION SkillsUSA

3.1 Determine the roles and responsibilities that leaders and members bring to an organization
3.2 Describe characteristics of an effective team member
3.3 Describe characteristics of an effective team leader
3.4 Describe characteristics of effective teams
3.5 Demonstrate teamwork
3.6 Develop and implement a personal and professional development plan
3.7 Identify personal leadership style

4.0 EXPLORE LEGAL AND ETHICAL ISSUES IN THE CONSTRUCTION TECHNOLOGIES INDUSTRY

4.1 Discuss legal responsibilities of construction technology employees to comply with government laws and regulations
4.2 Discuss ethics in the construction technology work environment
4.3 Identify workers' rights regarding the workplace issues including safety, drug testing, harassment, discrimination, privacy, etc. in construction technologies
4.4 Identify a personal/professional code of ethics

5.0 APPLY COMMUNICATION SKILLS FOR THE CONSTRUCTION TECHNOLOGIES FIELD

5.1 Apply basic oral and written communication skills for the construction technology field
5.2 Organize and deliver a demonstration/presentation in construction technology
5.3 Interpret verbal and nonverbal communication
5.4 Use construction technology vocabulary in context

6.0 DEMONSTRATE TECHNOLOGICAL LITERACY FOR THE CONSTRUCTION TECHNOLOGIES WORKPLACE

6.1 Demonstrate basic usage of computers (input, storage, output)
6.2 Access information electronically (i.e. via Internet, CD-ROM)
6.3 Demonstrate knowledge and understanding of basic Input/Output devices such as keyboards, scanners, printers and peripherals
6.4 Apply word processing software
6.5 Practice basic use of spreadsheets (i.e. for scheduling, estimates)

7.0 APPLY MATHEMATICAL PROCESSES TO PROBLEMS IN CONSTRUCTION TECHNOLOGIES

7.1 Express issues in construction technologies using numeric, symbolic and/or graphic representations
7.2 Perform mathematical calculations in the context of construction technologies problems
7.3 Recognize and use metric and English units of length, weight, volume and/or temperature
7.4 Identify common measurement tools used in construction technologies and their functions
7.5 Select and use the appropriate measurement tool for the task

8.0 APPLY PROBLEM SOLVING AND DECISION MAKING PROCESSES TO CONSTRUCTION TECHNOLOGIES RELATED SITUATIONS

8.1 Apply problem-solving processes to construction technology related problems
8.2 Prepare a plan of work and schedule activities in construction technologies
8.3 Access information using manuals and reference materials in order to solve a construction technology related problem

9.0 PRACTICE SAFE WORKING PROCEDURES IN A CONSTRUCTION TECHNOLOGIES ENVIRONMENT

9.1 Identify responsibilities of professionals in construction technologies in creating/maintaining a safe work environment
9.2 Practice appropriate safety precautions around common job-site hazards in construction technologies
9.3 Wear/use protective clothing/gear to ensure personal safety
9.4 Explain the importance of the OSHA (Occupational Safety and Health Administration) standards, HazCom (Hazard Communication Standard) requirements and MSDS (Material Safety Data Sheets) in construction technologies

10.0 PRACTICE SAFE USE OF TOOLS AND EQUIPMENT UTILIZED IN THE CONSTRUCTION TECHNOLOGIES FIELD

10.1 Recognize and demonstrate safe use of basic hand tools in construction technologies
10.2 Recognize and demonstrate safe use of hand-held power tools in construction technologies
10.3 Recognize and demonstrate safe use of power equipment in construction technologies
10.4 Practice basic procedures for safe storage and upkeep of tools utilized in construction technologies

11.0 INTERPRET SCHEMATICS, BLUEPRINTS AND TECHNICAL DRAWINGS UTILIZED IN CONSTRUCTION TECHNOLOGIES

11.1 Interpret tolerances associated with dimensions
11.2 Interpret spatial layout of three-dimensional form from two-dimensional drawing
11.3 Interpret dimensions, symbols, legends, scales, and directions
11.4 Interpret basic civil, electrical, and mechanical drawings

12.0 DEMONSTRATE DRAWING AND VISUALIZATION SKILLS FOR THE CONSTRUCTION TECHNOLOGIES FIELD

12.1 Sketch, draw, and illustrate concepts and ideas in construction technologies
12.2 Sketch or draw a plot plan and/or floor layout to scale

13.0 EXPLORE CONSTRUCTION TECHNOLOGIES

13.1 Investigate components of the construction industry (e.g., residential, commercial, heavy, etc.)
13.2 Describe how changing technology impacts construction systems
13.3 Identify environmental issues related to construction
13.4 Describe components of residential construction
13.5 Describe components of commercial/industrial construction
13.6 Differentiate the elements for planning, designing, and constructing
13.7 Examine the role of quality construction
13.8 Investigate Leeds and/or other green building standards

14.0 DEVELOP AN INDIVIDUAL CAREER PLAN FOR A CONSTRUCTION TECHNOLOGIES CAREER

14.1 Investigate career options including entrepreneurship or apprenticeship in the construction industry
14.2 Develop career goals in construction technologies based on interests, aptitudes, and research
14.3 Manage personal and career goals

15.0 PREPARE FOR EMPLOYMENT IN CONSTRUCTION TECHNOLOGIES

15.1 Develop a résumé
15.2 Complete job application process
15.3 Demonstrate pre-interview preparation and post-interview follow-up
15.4 Demonstrate interviewing skills for traditional and behavioral based interviews
15.5 Research a construction technologies organization as a potential employee

16.0 PARTICIPATE IN WORK-BASED LEARNING EXPERIENCES IN CONSTRUCTION TECHNOLOGIES

16.1 Use technology appropriate for the job
16.2 Demonstrate positive work behaviors and appreciation for diversity in construction technologies
16.3 Demonstrate safe and healthy work behaviors for the construction technology workplace

17.0 DEMONSTRATE ORAL COMMUNICATION SKILLS FOR CONSTRUCTION TECHNOLOGY

17.1 Use questioning techniques to obtain needed information from audience
17.2 Interpret oral and nonverbal communications of audience
17.3 Demonstrate active listening during communications
17.4 Prepare and deliver construction technology related presentations
17.5 Communicate using equitable and culturally sensitive language for a diverse audience
17.6 Demonstrate effective telephone technique for construction technologies

18.0 DEMONSTRATE WRITTEN COMMUNICATION SKILLS FOR CONSTRUCTION TECHNOLOGIES

18.1 Conduct formal/informal research to collect appropriate topical information
18.2 Organize information and develop an outline
18.3 Write construction technology related business communication using appropriate format for the situation
18.4 Using appropriate technology, prepare draft document using established rules for grammar, spelling and sentence construction
18.5 Utilize multiple technologies for written and presentation communications

19.0 EVALUATE THE ROLE OF THE CONSTRUCTION INDUSTRY IN THE ECONOMY

19.1 Evaluate role of construction industry on local, state, national and international economies
19.2 List the factors which contribute to the success in the construction industry
19.3 Compare/contrast the advantages/disadvantages of sole proprietorships, partnerships and corporations
19.4 Analyze the relationship of customer service and customer satisfaction on the success of a business

20.0 DEMONSTRATE BUSINESS AND FINANCIAL MANAGEMENT PRACTICES NEEDED FOR AN INDEPENDENT CONTRACTOR

20.1 Develop a budget based on a construction project
20.2 Develop an income statement for a project
20.3 Develop a balance sheet for a project
20.4 Develop an estimate and bid for a project

21.0 EVALUATE LEADERSHIP STYLES APPROPRIATE FOR THE CONSTRUCTION TECHNOLOGIES WORKPLACE

21.1 Determine personal characteristics of effective leaders
21.2 Compare/contrast leadership and management styles
21.3 Describe how cultural/ethnic differences affect interpersonal interactions/communications within a group

22.0 PARTICIPATE IN LEADERSHIP ACTIVITIES SUCH AS THOSE SUPPORTED BY CAREER AND TECHNICAL STUDENT ORGANIZATION SkillsUSA

22.1 Determine the roles and responsibilities that leaders and members bring to an organization
22.2 Evaluate characteristics of effective teams
22.3 Evaluate characteristics of an effective team player
22.4 Practice techniques to involve each member of the team
22.5 Demonstrate team work
22.6 Practice effective meeting management
22.7 Demonstrate business etiquette
22.8 Practice decision-making processes

23.0 MAINTAIN A SAFE WORK ENVIRONMENT IN CONSTRUCTION TECHNOLOGIES

23.1 Identify regulations pertaining to job site hazards and safety in construction technologies
23.2 Use appropriate personal protective equipment for construction technologies
23.3 Apply the procedures for the handling of hazardous materials/chemicals including the use of MSDS (Material Safety Data Sheets)
23.4 Evaluate types of fires and use of appropriate fire extinguishers
23.5 Maintain worksite safety and housekeeping
23.6 Demonstrate first aid procedures
23.7 Develop safety plan for emergency situations
23.8 Demonstrate safe procedures for lifting heavy objects
23.9 Follow safe procedures in set up of scaffold and use of ladder
23.10 Demonstrate safe work procedures around electrical hazards
23.11 Explain the purpose of OSHA and how it promotes safety on the job
23.12 Use correct procedures for lockout/tag out

24.0 OPERATE HAND AND POWER TOOLS/EQUIPMENT UTILIZED IN CONSTRUCTION TECHNOLOGIES

24.1 Use and maintain hand tools
24.2 Use and maintain portable power tools, powder actuated tools and extension cords
24.3 Use and maintain stationary power equipment
24.4 Use and properly maintain electric test equipment

25.0 USE PLANS, SPECIFICATIONS AND CODES

- 25.1 Interpret blueprint terms, components, and symbols
- 25.2 Interpret a set of drawings/symbols/scales and legends
- 25.3 Read equipment schedules on blueprints
- 25.4 Use working drawings and specifications
- 25.5 Relate information on blueprints to actual locations
- 25.6 Interpret and use drawing dimensions
- 25.7 Demonstrate knowledge and application of relevant building codes (i.e. residential, commercial, energy, electrical, plumbing)

26.0 DEMONSTRATE MATH SKILLS RELATED TO CONSTRUCTION INDUSTRY

- 26.1 Add, subtract, multiply and divide whole numbers, with and without a calculator
- 26.2 Add, subtract, multiply and divide fractions
- 26.3 Convert decimals to percents and percents to decimals
- 26.4 Convert fractions to decimals and decimals to fractions
- 26.5 Use the metric system as required in the construction trade
- 26.6 Recognize some of the basic shapes used in the construction industry and apply geometry to measure them

*27.A LAY OUT BUILDING LINES

- 27.1a Demonstrate the use and care of precision measuring instruments
- 27.2a Establish building lines
- 27.3a Use a builder's level or transit and differential leveling procedures to determine site and building elevations
- 27.4a Record site layout data and information in field notes using accepted practices

*28.A PERFORM CONCRETE/MASONRY WORK

- 28.1a Prepare and pour a footing
- 28.2a Construct a foundation wall or pier
- 28.3a Lay brick/block to specification
- 28.4a Cut brick and block accurately
- 28.5a Demonstrate the process of depositing, spreading, consolidating, and striking off concrete in a form
- 28.6a Construct concrete formwork
- 28.7a Estimate the material needed for concrete/masonry work

*29.A LAY OUT AND INSTALL FLOOR SYSTEMS

- 29.1a Install sill plate(s)
- 29.2a Set posts
- 29.3a Construct or place girders/beams
- 29.4a Match selected fasteners used in floor framing to their correct uses
- 29.5a Estimate the amount of material needed to frame a floor assembly
- 29.6a Lay out and construct floor assembly
- 29.7a Install joists for a cantilever floor
- 29.8a Install a subfloor using butt-joint plywood/OSB panels

*30.A DEMONSTRATE WALL AND CEILING FRAMING

- 30.1a Lay out wall lines including plates, corner posts, door and window openings, partition Ts, bracing and plan for installation of fire stops
- 30.2a Assemble wood stud walls
- 30.3a Assemble metal stud walls
- 30.4a Lay out, assemble, erect, and brace exterior walls for a frame building
- 30.5a Cut and install ceiling joists on a wood frame building
- 30.6a Estimate the materials required to frame walls and ceilings

*31.A FRAME AND FINISH A ROOF

- 31.1a Construct conventional roof or set truss systems
- 31.2a Install roof sheathing and coverings
- 31.3a Frame a roof opening
- 31.4a Demonstrate the techniques for installing a variety of types of roofing materials
- 31.5a Estimate the materials used in framing and sheathing a roof

*32.A IDENTIFY THERMAL AND MOISTURE PROTECTION

- 32.1a Install insulation material
- 32.2a Install vapor barrier
- 32.3a Identify types and use of thermal insulation

*33.A APPLY EXTERIOR FINISHES

- 33.1a Install frieze boards and/or soffit
- 33.2a Install exterior moldings and trim
- 33.3a Demonstrate the installation of various types of siding
- 33.4a Apply correct installation to eliminate water intrusion
- 33.5a Install exterior stucco finish

*34.A INSTALL DOORS AND WINDOWS

- 34.1a Install doors
- 34.2a Install door hardware
- 34.3a Install windows

*35.A INSTALL INTERIOR TRIM AND STAIRS

35.1a Install baseboards and casings
35.2a Lay out and cut stringers
35.3a Determine the number and sizes of risers and treads required for a stairway
35.4a Build a small stair unit
35.5a Lay out a skirt board

*36.A ASSEMBLE PIPING, WASTE AND VENT DISTRIBUTION SYSTEMS

36.1a Assemble a soil, waste and vent system
36.2a Assemble a water distribution system
36.3a Install plumbing fixtures or equipment
36.4a Demonstrate the ability to properly measure, cut, and join plastic and copper piping
36.5a Identify the major components of a drainage system; describe their functions and how they malfunction

*37.A INSTALL ELECTRICAL COMPONENT/SYSTEM(S)

37.1a Identify electrical service entrance requirements
37.2a Rough in switch boxes and outlet boxes
37.3a Rough in feeder and circuit
37.4a Install low voltage systems
37.5a Trim out electrical devices and appliances
37.6a Install lighting fixture(s) and ceiling fans

*38.A INSTALL INTERIOR WALL AND CEILING FINISH

38.1a Identify type and use of drywall
38.2a Demonstrate the proper techniques for cutting drywall
38.3a Fasten drywall to ceiling and walls
38.4a Apply mud, use tape appropriately and install corner bead
38.5a Demonstrate technique for paint application