KANSAS STATE CAREER CLUSTER COMPETENCY PROFILE (C.I.P. 46.0000)

CONSTRUCTION PATHWAY

ARCHITECTURE & CONSTRUCTION

STUDENT_____

Rating Scale:

4 - Exemplary Achievement
3 - Proficient Achievement
2 - Limited Achievement
1 - Inadequate Achievement
0 - No Exposure

Graduation Date _____

I certify that the student has received training in the areas indicated.

Instructor Signature _____

Instructor Signature _____

Instructor Signature _____

Instructor Signature _____

38001-INTRODUCTION TO INDUSTRIAL TECHNOLOGY (.5 Credit)

An introductory level course designed to instruct students in the basic skills necessary to all occupations in the Construction, Manufacturing & Transportation areas.

4 3 2 1 0 1. **Basic Safety**

-Identify causes of accidents and the impact of accident costs.
- Follow safe behavior procedures on and around ladders, scaffolds and stairs.
-Follow safe behavior procedures around electrical hazards.
-Demonstrate the use, care and inspection of appropriate personal protective equipment (PPE)
-Explain the importance of hazard communications (HazCom) and material safety data sheets (MSDSs).
-Respond to hazardous-materials and hazardous-waste emergency situations in accordance with regulatory requirements.
- Follow safety procedures required for lifting heavy objects.
-Demonstrate a working knowledge of safety education, environment, and enforcement for life and work.
- Apply safe practices while using tools and equipment.
-Apply safe practices for housekeeping,
dress, fire, chemicals & personal protection while working in a shop.
-Describe fire prevention and firefighting techniques.
-Explain the purpose of OSHA and how it promotes safety on the job.

4 3 2 1 0 2. **Industrial Math**

-Add, subtract, multiply, and divide whole numbers, fractions, decimals and percentages.
-Use a standard ruler, a metric ruler, and a measuring tape to measure.
-Demonstrate conversion skills for decimals and fractions.
-Recognize and perform calculations using metric units of length, weight, volume and temperature.

4 3 2 1 0 3. **Hand Tools**

-Recognize and identify some of the basic hand tools and their proper uses in industrial trades.
-Demonstrate the safe use of common hand tools.

4 3 2 1 0 4. **Power Tools**

-Recognize and identify some of the basic power tools and their proper uses in the industrial trades.
-Demonstrate the safe use of common power tools.
-Perform preventive maintenance on basic power tools used in the industrial trades.

4 3 2 1 0 5. **Blueprint Reading**

-Perform the drafting principles needed to draw the basic geometric shapes.
-Develop a pictorial sketch of an object.
-Develop a multi-view drawing.
-Identify basic symbols used in blueprints.
-Identify various types of blueprint views used in Architecture, Construction, Manufacturing and Engineering.

4 3 2 1 0 6. **Communication Skills**

-Interpret information and follow instructions presented in both verbal and written form.
-Communicate effectively in on-the-job situations using verbal and written

skills in various delivery modes (face-to-face, paper, & electronic).
-Create and complete various written documents used in industrial trades.
-Demonstrate knowledge and use of computer systems and word processing software in effective communication.

4 3 2 1 0 7. **Employability Skills**
-Create and utilize employment documents including a resume and portfolio.
-Demonstrate job seeking and interview skills.
-Understand and respond to performance reviews.

4 3 2 1 0 8. **21st Century/Foundation Skills**
-Demonstrate critical thinking skills and the ability to solve problems using those skills.
-Define effective relationship skills.
-Demonstrate a working knowledge of workplace issues such as sexual harassment, stress, and substance abuse.
-Demonstrate the ability to achieve common goals through team work

4 3 2 1 0 8. **Materials Handling**
-Verify that health, safety, environmental and government regulations are met.
-Recognize hazards and follow safety procedures required for materials handling.
-Demonstrate ability to load and unload materials properly and safely.

4 3 2 1 0 9.
4 3 2 1 0 10.

21102-DRAFTING (Architectural & Mechanical) (.5 Credit)
An introductory course designed to expose students to both architectural and mechanical (technical) drafting skills.

4 3 2 1 0 1. Identify types of architectural and mechanical drawings.
4 3 2 1 0 2. Display knowledge of careers in architecture and drafting.
4 3 2 1 0 3. Display knowledge of drafting standards (line styles, dimensions, sheet layout, etc.)
4 3 2 1 0 4. Demonstrate ability to perform manual drafting skills.
4 3 2 1 0 5. Demonstrate ability to do lettering on a drawing.
4 3 2 1 0 6. Demonstrate ability to perform sketching, geo construction and 2d drafting.
4 3 2 1 0 7. Demonstrate the ability to dimension a drawing.
4 3 2 1 0 8. Demonstrate visualization skills in orthographic projection.
4 3 2 1 0 9. Display knowledge of architectural symbols.
4 3 2 1 0 10.
4 3 2 1 0 11.

17002-RESIDENTIAL CARPENTRY I (1 Credit) Pre-requisite for Residential Carpentry II
A comprehensive course designed to instruct students in the basic knowledge and skills required for construction of residential structures.

4 3 2 1 0 1. Safely utilize and maintain tools common to the building trades industry.
4 3 2 1 0 2. Demonstrate Blueprint reading skills including the interpretation of plans, elevations, schedules, sections and details.
4 3 2 1 0 3. Estimate building materials and cost for a project.
4 3 2 1 0 4. Set up and utilize leveling instruments
4 3 2 1 0 5. Install sill seal and sill plate to the foundation.
4 3 2 1 0 6. Lay out, construct and erect walls and partitions.
4 3 2 1 0 7. Lay out, cut and install ceiling joists.
(Divide competencies here if teaching as two .5 cr. Courses)
4 3 2 1 0 8. Construct a frame roof and apply sheathing.
4 3 2 1 0 9. Install a pre-hung window.
4 3 2 1 0 10. Install a pre-hung exterior door with weather-stripping.
4 3 2 1 0 11. Install a lockset on an entry door.
4 3 2 1 0 12. Describe the types of and demonstrate the application of common wood sidings used as exterior finishes.
4 3 2 1 0 13. Apply fiberglass shingles with a 5” exposure, including at least one rooftop projection.
4 3 2 1 0 14. Install factory-made cabinets, countertops, and backsplashes.
4 3 2 1 0 15. Obtain the OSHA 10 Hour Safety Training Certificate of Completion.

38002- RESIDENTIAL CARPENTRY II (1 Credit)
An advanced comprehensive course designed to instruct students in skills pertaining to rough construction and finish work.

4 3 2 1 0 1. Erect, plumb and brace concrete forms.
4 3 2 1 0 2. Install footings and foundations.
4 3 2 1 0 3. Install thermal and sound insulation.
4 3 2 1 0 4. Demonstrate ability to:
-Lay out and construct a floor assembly
-Install bridging
-Install joists
-Install subflooring
-Install a single floor system using tongue-and-groove plywood/OSB panels.
4 3 2 1 0 5. Lay out, construct and erect walls and partitions.
4 3 2 1 0 6. Describe the need for and install insulation materials and vapor barriers.

4 3 2 1 0 7. Install gypsum drywall panels on stud walls and ceilings using different types of fastening systems.
4 3 2 1 0 8. Demonstrate ability to properly finish drywall and patch damaged drywall.

(Divide competencies here if teaching as two .5 cr. Courses)

4 3 2 1 0 9. Construct a frame roof, including hips, valleys, commons, jack rafters and sheathing.
4 3 2 1 0 10. For a stairway of given dimensions, determine the total rise, the number and size of the risers, and the number and size of the treads.
4 3 2 1 0 11. Construct a staircase according to a specific plan.
4 3 2 1 0 12. Install a pre-hung interior door.
4 3 2 1 0 13. Install interior trim, including door, window, base and ceiling trims.
4 3 2 1 0 14. Identify and install various types of floor systems.
4 3 2 1 0 15. Use technology and resources to research licensing certification and credentialing in the construction industry.

17005-RESEARCH & DESIGN IN BUILDING TRADES (1 Credit)

An advanced research and application course covering specific topics in building construction to include management and "green building" skills.

4 3 2 1 0 1. Draw set of house plans.
4 3 2 1 0 2. Research building permits and codes.
4 3 2 1 0 3. Research footings and foundations.
4 3 2 1 0 4. Research post and beam construction.
4 3 2 1 0 5. Research system-built housing.
4 3 2 1 0 6. Research careers in building trades.
4 3 2 1 0 7. Research applications of "green building".

(Divide competencies here if teaching as two .5 cr. Courses)

4 3 2 1 0 8. Demonstrate knowledge of advanced roof systems, including seam metal roofs.
4 3 2 1 0 9. Demonstrate knowledge of advanced floor systems and floor coverings.
4 3 2 1 0 10. Demonstrate knowledge of advanced wall systems including firewalls and sound control walls.
4 3 2 1 0 11. Demonstrate knowledge of advanced stair systems including stairs for commercial construction.
4 3 2 1 0 12. Research Modern & Future trends in equipment, methods & techniques
4 3 2 1 0 13. Research Modern & Future trends in material management
4 3 2 1 0 14. Utilize effective management techniques to organize work flow.
4 3 2 1 0 15.

17113- ELECTRICAL & SECURITY SYSTEMS (.5 Credit)

A course designed to instruct students in the basic skills required for installation of electrical and security systems.

4 3 2 1 0 1. Cut, ream, thread and bend conduit.
4 3 2 1 0 2. Compute branch circuit loads and explain installation requirements.
4 3 2 1 0 3. Demonstrate the procedure for safely using a clamp-on ammeter and a voltage tester.
4 3 2 1 0 4. Demonstrate procedures for installing raceways and boxes.
4 3 2 1 0 5. Demonstrate ability to correctly pull wire through conduit.
4 3 2 1 0 6. Select and install appropriate service entrance equipment according to codes.
4 3 2 1 0 7. Demonstrate the ability to properly ground electrical circuits according to codes.
4 3 2 1 0 8. Install breakers, plugs and switches.
4 3 2 1 0 9. Explain basic characteristics of series and parallel circuits.
4 3 2 1 0 10. Recognize and install various types of lighting fixtures.
4 3 2 1 0 11. Describe characteristics and functions of various fire alarm systems.
4 3 2 1 0 12. Describe characteristics and functions of various security and burglar alarm systems.
4 3 2 1 0 13. Describe the uses, characteristics and theory of low voltage systems.
4 3 2 1 0 14. Demonstrate knowledge of the uses and installation process for Closed Circuit TV.
4 3 2 1 0 15. Describe the components of and uses for electric lock hardware.
4 3 2 1 0 16. Demonstrate safe use of electric hand and power tools.
4 3 2 1 0 17. Understand and interact with LAN systems as a part of an overall security installation.
4 3 2 1 0 18. Demonstrate ability to install a lightning protection system.
4 3 2 1 0 19. Troubleshoot and repair problems in lighting fixtures, including ballast replacement.

17060- HVAC & PLUMBING SYSTEMS (.5 Credit)

A course design to instruct students in the basic skills required to install HVAC and plumbing systems

4 3 2 1 0 1. Demonstrate proper use of basic hand and power tools used in the plumbing trade.
4 3 2 1 0 2. Correctly measure, cut, ream, join, groove and/or thread plastic, cast-iron, carbon steel and/or stainless steel piping/tubing.
4 3 2 1 0 3. Identify and install the most commonly installed lavatories, tubs, sinks and toilets.

4 3 2 1 0 4. Identify and describe the function of the major components of a water distribution system.
4 3 2 1 0 5. Identify & install pipe hangers and supports for DWV (drainage, waste, vent) and water supply systems.
4 3 2 1 0 6. Demonstrate or explain how to correctly size & install a building sewer and a building drain, and final connection.
4 3 2 1 0 7. Test a DWV system according to code.
4 3 2 1 0 8. Demonstrate installation of electric and gas water heaters.
4 3 2 1 0 9. Install different types of plumbing vents correctly.
4 3 2 1 0 10. Explain the basic principles of heating, ventilating and air conditioning.
4 3 2 1 0 11. Describe how the *Clean Air Act* affects the HVAC trade and describe the types of regulatory codes affecting the HVAC trade.
4 3 2 1 0 12. Identify the types of schedules/ drawings used in the HVAC trade.
4 3 2 1 0 13. Correctly measure, cut, bend and/or join copper tubing and plastic pipe.
4 3 2 1 0 14. Perform soldering and brazing applications.
4 3 2 1 0 15. Demonstrate an understanding of the terms and concepts used in the refrigeration cycle.
4 3 2 1 0 16. Identify the major components of a cooling system and explain how each type works.
4 3 2 1 0 17. Identify the major components of gas, oil and electric furnaces and describe how each type works.
4 3 2 1 0 18. Demonstrate or explain the use and installation of duct systems, diffusers, registers, dampers, insulation and vapor barriers for an air distribution system.
4 3 2 1 0 19. Make basic temperature, air pressure, and velocity measurements in an air distribution system.
4 3 2 1 0 20.

17009-REMODEL & BUILDING MAINTENANCE (.5 Credit)

An application level course designed to instruct students in the skills required for residential remodeling and maintenance.

4 3 2 1 0 1. Apply needed caulking and/or paint to interior and exterior finishes.
4 3 2 1 0 2. Demonstrate ability to repair/replace damaged wallboard, wood trim and cabinetry.
4 3 2 1 0 3. Utilize knowledge of bearing walls when reconfiguring room design and/or constructing building additions.
4 3 2 1 0 4. Repair/replace floor coverings.
4 3 2 1 0 5. Troubleshoot and repair problems with HVAC systems.
4 3 2 1 0 6. Troubleshoot and repair water supply, water heater, and water drainage problems.
4 3 2 1 0 7. Troubleshoot and repair problems in lighting fixtures, including ballast replacement.
4 3 2 1 0 8. Utilize appropriate meters/tools to locate electrical circuit problems.
4 3 2 1 0 9. Replace breakers, plugs, switches and light fixtures.
4 3 2 1 0 10. Repair/Replace windows, storm windows, doors and storm doors.
4 3 2 1 0 11. Install and perform maintenance procedures on electric motors.
4 3 2 1 0 12. Evaluate and assess the extent and condition of remodeling/maintenance problems.
4 3 2 1 0 13. Develop a checklist to track preventative maintenance.
4 3 2 1 0 14.

17007-CABINETMAKING AND FURNITURE DESIGN I (1 Credit) Pre-requisite for Cabinetmaking & Furniture Design II

A comprehensive course designed to instruct students in the basic knowledge and skills required for cabinetmaking and furniture design

4 3 2 1 0 1. Utilize hand tools for cutting, scraping or planing the stock for a project.
4 3 2 1 0 2. Apply math skills to control distance, spacing &/or angle measurements and placements for constructing a project.
4 3 2 1 0 3. Utilize portable power tools to construct a project.
__belt sander __router __hand drill
__power plane __finish sander __nail gun
__circular saw __reciprocating saw
4 3 2 1 0 4. Utilize machines to construct a project.
__radial arm __jointer __planer/surface
__table saw __band saw __drill press
__power miter saw __shaper __mortiser
__thickness sander __lathe __scroll saw
__panel saw __disc/belt sander __grinder

(Divide competencies here if teaching as two .5 cr. Courses)

4 3 2 1 0 5. Perform the steps to interpret, transfer and layout lines &/or markings to be used for constructing a project.
4 3 2 1 0 6. Construct a project, incorporating the elements & principles of design as related to traditional styles in history.
4 3 2 1 0 7. Select and perform "best-method" for joining and assembling project parts.
4 3 2 1 0 8. Apply a quality finish on a project utilizing appropriate materials & equipment.
4 3 2 1 0 9. Obtain the OSHA 10 Hour Safety Training Certificate of Completion.
4 3 2 1 0 10.
4 3 2 1 0 11.

38007-CABINETMAKING AND FURNITURE DESIGN II (1 Credit)

An advanced level application course designed to provide students with experience in constructing cases, cabinets, counters, furniture and interior woodwork

4 3 2 1 0 1. Properly use, maintain & care for hand tools common to woodworking industry.

4 3 2 1 0 2. Properly set up, maintain and care for machines and power tools as they are used for constructing projects.

4 3 2 1 0 3. Apply traditional history with the principles and elements of design to create project plans, which fulfills the criteria for the project to be constructed.

4 3 2 1 0 4. Select quality wood, based upon; strength, appearance and durability requirements of the project designed.

4 3 2 1 0 5. Create a bill of material, and a plan of procedure for a project being planned for construction.

4 3 2 1 0 6. Estimate costs of a project.

(Divide competencies here if teaching as two .5 cr. Courses)

4 3 2 1 0 7. Utilize the common styles and methods to construct and install cabinet and/or furniture sub-assemblies:

__ bases __flush drawer __lip drawer
__flush door __lip door __ overlay door
__frame & panel door __mouldings
__carved appliqués __hardware

4 3 2 1 0 8. Select and apply "best method" joint construction and fitting for project being constructed.

4 3 2 1 0 9. Select and perform "best-method" assembly techniques for cabinet or furniture construction.

4 3 2 1 0 10. Select and perform the appropriate finish for the cabinet or furniture project being constructed.

4 3 2 1 0 11. Properly set up, maintain and care for the tools and equipment used for finishing cabinets and furniture.

4 3 2 1 0 12.

17014- COMMERCIAL CONSTRUCTION TECHNOLOGY (.5 Credit)

An introductory level course designed to instruct students in the basic skills pertaining to commercial construction.

4 3 2 1 0 1. Safely utilize and maintain tools common to the commercial construction trade.

4 3 2 1 0 2. Demonstrate blueprint reading skills for site layout.

4 3 2 1 0 3. Demonstrate ability to correctly complete six courses of brick veneer.

4 3 2 1 0 4. Demonstrate ability to assemble steel stud project from blueprint.

4 3 2 1 0 5. Demonstrate knowledge of basic electrical circuits, safety and determining appropriate wire size for specific usage.

4 3 2 1 0 6. Demonstrate ability to construct staircase from blueprint.

4 3 2 1 0 7. Assemble scaffolding according to OSHA requirements.

17015- COMMERCIAL CONSTRUCTION CAREERS I (1 Credit)

A comprehensive course designed to instruct students in the knowledge and skills required to construct commercial buildings.

4 3 2 1 0 1. Demonstrate working knowledge of tools, skills, vocabulary and construction methods of steel erection and precast concrete.

4 3 2 1 0 2. Demonstrate use of safety equipment used by ironworkers.

4 3 2 1 0 3. Identify OSHA requirements for steel erection and for fall protection.

4 3 2 1 0 4. Demonstrate ability to direct crane with use of proper hand signals.

4 3 2 1 0 5. Demonstrate ability to assemble onsite fabricated components to form a complete structure from blueprints.

4 3 2 1 0 6. Identify terminology found in MBMA systems including structural loads and safety.

4 3 2 1 0 7. Install a BUR and EPDM roof system on mockup roof.

4 3 2 1 0 8. Measure and calculate roof area to determine material needs.

4 3 2 1 0 9. Demonstrate knowledge of roofing terminology.

4 3 2 1 0 10. Identify essential vocabulary and tools used in sheet metal and HVAC.

4 3 2 1 0 11. Calculate HVAC loads for simple space.

4 3 2 1 0 12. Cut out and assemble ductwork from blueprints, safely using all appropriate machines.

4 3 2 1 0 13. Demonstrate understanding of climatic control systems.

4 3 2 1 0 14. Identify components of a simple HVAC system.

4 3 2 1 0 15. Complete block foundation and brick veneer project from blueprints.

4 3 2 1 0 16. Describe how to size water and waste pipe in building from blueprints.

4 3 2 1 0 17. Correctly assemble plastic, copper, and/or cast iron in cubical according to blueprints, including appropriate pressure tests.

(Divide competencies here if teaching as two .5 cr. Courses)

4 3 2 1 0 18. Compare and contrast frame and glass installations in commercial construction.

4 3 2 1 0 19. Cut and install glass in an aluminum frame window.

4 3 2 1 0 20. Identify various earth-moving and excavating equipment, GPS systems, and their uses.

4 3 2 1 0 21. Identify major bridge construction components.

4 3 2 1 0 22. Explain highway construction components from site prep to completion.
4 3 2 1 0 23. Identify reasons for using behavior modification safety program.
4 3 2 1 0 24. Order materials and construct simple forms with blockouts from blueprints.
4 3 2 1 0 25. Develop material and cost list from blueprint.
4 3 2 1 0 26. Safely assemble commercial construction project from blueprints, using necessary tools.
4 3 2 1 0 27. Identify basic electrical circuits and common materials used in electrical trades.
4 3 2 1 0 28. Install breakers, boxes and conduit according to blueprints.
4 3 2 1 0 29. Install and test electrical fixtures.
4 3 2 1 0 30. Demonstrate knowledge of mixing components and they affect concrete strength.
4 3 2 1 0 31. Describe methods for controlling cracking of concrete.
4 3 2 1 0 32. Form, pour and finish concrete.
4 3 2 1 0 33. Use a slump test to measure consistency of concrete.

38015- COMMERCIAL CONSTRUCTION CAREERS II (1 Credit)

An advanced level application course designed to instruct students in the design and management areas of commercial construction.

4 3 2 1 0 1. Interview potential customers and secure customer's vision of project.
4 3 2 1 0 2. Design and draw blueprints for projects.
4 3 2 1 0 3. Develop Bill of Materials and cost estimate.
4 3 2 1 0 4. Develop plan for transporting and cost.
4 3 2 1 0 5. Develop work schedule and completion date.

(Divide competencies here if teaching as two .5 cr. Courses)

4 3 2 1 0 6. Secure customer's approval to proceed.
4 3 2 1 0 7. Construct projects as per customer specifications and according to all signed documents.
4 3 2 1 0 8. Demonstrate job search components including:
-Interviewing
-Document creation (resume, letters, etc.)
-Evaluating career choices based on first-hand occupational experience and research
-Analyzing and designing ways to manage income
-Identifying elements of health and safety on the job
-Developing personal characteristics to be successful on the job
-Explaining your role as a wage earning citizen.

17062 – SKILLED MECHANICAL CRAFTS (.5 Credit)

An introductory level course designed to instruct students in the basic skills necessary for occupations in skilled mechanical crafts.

4 3 2 1 0 1. Utilize technology resources to investigate training, education and careers available in the mechanical trades fields of construction.
4 3 2 1 0 2. Perform the drafting and sketching principles needed to draw basic geometric shapes.
4 3 2 1 0 3. Develop a pictorial sketch of an object.
4 3 2 1 0 4. Develop a multi-view drawing.
4 3 2 1 0 5. Develop a flat-view of an object as it would be seen before assembly.
4 3 2 1 0 6. Develop a materials list for the construction of a project.
4 3 2 1 0 7. Recognize and identify basic blueprint terms, components and symbols.
4 3 2 1 0 8. Demonstrate the ability to read a ruler and calculate square feet and cubic feet.

17056 – HVAC TECHNOLOGY (.5 Credit)

A course designed to provide students with exposure to and training in the theories, equipment and skills needed to install and maintain HVAC systems.

4 3 2 1 0 1. Safely utilize and maintain tools common to the mechanical trades industry.
4 3 2 1 0 2. Describe the heating and cooling process.
4 3 2 1 0 3. Demonstrate the use of a duct calculator and the formulas used to calculate heat loads.
4 3 2 1 0 4. Apply layout to HVAC projects.
4 3 2 1 0 5. Describe various types of heating and cooling systems, including the pros, cons and applications of each.
4 3 2 1 0 6. Demonstrate basic electrical knowledge of how electrical circuits work and how they are used within the industry.
4 3 2 1 0 7. Install basic and programmable heat/cool thermostats.
4 3 2 1 0 8. Describe thermostat wire and identify what each color should be used for.
4 3 2 1 0 9. Research future trends in "green technology" for the HVAC industry.
4 3 2 1 0 10. Troubleshoot and repair problems with HVAC systems.
4 3 2 1 0 11. Correctly measure, cut and join piping/tubing.
4 3 2 1 0 12. Demonstrate proper soldering techniques.

4 3 2 1 0 13. Demonstrate ability to maintain appropriate maintenance documentation.

13205 – SHEET METAL TECHNOLOGY (.5 Credit)

A course designed to provide students with exposure to and training in the theories, equipment and skills needed to perform sheet metal techniques.

4 3 2 1 0 1. Safely utilize and maintain tools common to the sheet metal trade.
4 3 2 1 0 2. Demonstrate blueprint reading skills including the interpretation of plans, elevations, schedules, and details.
4 3 2 1 0 3. Identify the three basic types of layout: parallel line, radial line, and triangulation.
4 3 2 1 0 4. Layout and fabricate a basic joint of ductwork, including seams and transverse joints.
4 3 2 1 0 5. Utilize a tape measure to obtain correct measurements for a ductwork detail.
4 3 2 1 0 6. Describe types and thicknesses of sheet metal.
4 3 2 1 0 7. Layout and fabricate basic sheet metal fittings.
4 3 2 1 0 8. Describe the different seams commonly used for ductwork and explain the advantages of each.

17058 – PLUMBING TECHNOLOGY (.5 Credit)

A course designed to provide students with exposure to and training in the theories, equipment and skills needed to install and maintain plumbing systems.

4 3 2 1 0 1. Demonstrate proper use of basic hand and power tools used in the plumbing trade.
4 3 2 1 0 2. Correctly measure, cut and join plastic, carbon steel and/or stainless steel piping/tubing.
4 3 2 1 0 3. Identify and install the most common types of sinks and toilets.
4 3 2 1 0 4. Identify and describe the functions of the major components of a water distribution system.
4 3 2 1 0 5. Identify and install pipe hangers and supports.
4 3 2 1 0 6. Identify the types of schedules and drawings used within the plumbing trade.
4 3 2 1 0 7. Demonstrate proper soldering techniques.
4 3 2 1 0 8. Identify different types of plumbing systems and their components.
4 3 2 1 0 9. Demonstrate proper safety procedures within the plumbing trade.

17052 – REFRIGERATION TECHNOLOGY (.5 Credit)

A course designed to provide students with exposure to and training in the theories, equipment and skills needed to install and maintain refrigeration systems.

4 3 2 1 0 1. Demonstrate proper use of hand and power tools used in the refrigeration trade.
4 3 2 1 0 2. Demonstrate proper safety procedures within the refrigeration trade.
4 3 2 1 0 3. Correctly measure, cut, ream, and join copper and/or plastic pipe and tubing.
4 3 2 1 0 4. Identify the different types of copper tubing and characteristics of each type.
4 3 2 1 0 5. Explain the basic principles of a refrigeration system.
4 3 2 1 0 6. Identify and describe the major components of a refrigeration system and the roles they take in the refrigeration process.
4 3 2 1 0 7. Demonstrate how to read a basic schematic drawing and the basic symbols.
4 3 2 1 0 8. Compare and contrast different types of refrigeration systems.

17061 – PIPEFITTING TECHNOLOGY (1 Credit)

A course designed to provide students with exposure to and training in the theories, equipment and skills needed to perform pipefitting techniques.

4 3 2 1 0 1. Demonstrate proper safety procedures within the pipefitting trade.
4 3 2 1 0 2. Identify piping schedules (thickness) and applications.
4 3 2 1 0 3. Correctly measure, cut, ream, thread, and join carbon steel pipe.
4 3 2 1 0 4. Describe and identify common fitting used in the pipefitting trade.
4 3 2 1 0 5. Identify and install pipe hanging systems and supports.
4 3 2 1 0 6. Demonstrate proper use basic hand and power tools used in the pipefitting trade.
4 3 2 1 0 7. Demonstrate proper mathematical equations used to figure piping offsets.
4 3 2 1 0 8. Identify the types of drawings/schedules used in the pipefitting trade.

THE FOLLOWING ARE NOT STAND-ALONE COURSES. THEY ARE SKILLS TO BE EMBEDDED IN ALL COURSES.

WORKPLACE SAFETY SKILLS (Embedded in all Core CTE Courses)

4 3 2 1 0 1. Demonstrate a working knowledge of safety education, environment, and enforcement for life and work.
4 3 2 1 0 2. Apply safe practices while using tools and equipment to construct a project.
4 3 2 1 0 3. Apply safe practices for housekeeping, dress, fire, chemicals & personal protection while working in a shop.
4 3 2 1 0 4. Demonstrate the use and care of appropriate personal protective equipment (PPE).

4 3 2 1 0 5. Explain the importance of Hazard Communications (HazCom) and Material Safety Data Sheets (MSDS)
4 3 2 1 0 6. Describe fire prevention and firefighting techniques.
4 3 2 1 0 7. Follow safety procedures required for lifting heavy objects.
4 3 2 1 0 8. Follow safe behavior procedures on and around ladders and scaffolds.
4 3 2 1 0 9. Explain the purpose of OSHA and how it promotes safety on the job.
4 3 2 1 0 10. Respond to hazardous-materials and hazardous-waste emergency situations in accordance with regulatory requirements.

LEADERSHIP/21ST CENTURY SKILLS (Embedded in all Core CTE Courses)

4 3 2 1 0 1. Demonstrates speaking skills
4 3 2 1 0 2. Utilizes listening skills
4 3 2 1 0 3. Uses writing skills to produce and compile documents
4 3 2 1 0 4. Uses decision making / problem solving skills
4 3 2 1 0 5. Participates as team member to achieve common goals
4 3 2 1 0 6. Demonstrates time management
4 3 2 1 0 7. Takes responsibility and displays work ethics
4 3 2 1 0 8. Establishes positive relations with others
4 3 2 1 0 9. Demonstrate a working knowledge of workplace issues such as sexual harassment, stress, and substance abuse.

CAREER DEVELOPMENT SKILLS (Embedded in all Core CTE Courses)

4 3 2 1 0 1. Utilizes effective job seeking skills
4 3 2 1 0 2. Created and utilizes an occupationally specific resume
4 3 2 1 0 3. Created and utilizes a portfolio
4 3 2 1 0 4. Understands proper interview techniques
4 3 2 1 0 5. Understands performance reviews
4 3 2 1 0 6. Explain the construction industry, the role of companies within the industry, and the role of individual professionals in the industry.
4 3 2 1 0 7. Demonstrate the value of computers in the construction industry through use of email, databases, Internet and billing/inventory software.

ACADEMIC SKILLS (Embedded in all Core CTE Courses)

4 3 2 1 0 1. Apply the four basic math functions to whole numbers, decimals, percentages and fractions.
4 3 2 1 0 2. Use a standard ruler and a metric ruler to measure.
4 3 2 1 0 3. Explain the importance of the metric system in the construction trade and utilize metric units of length, weight, volume and temperature.
4 3 2 1 0 4. Recognize the basic shapes used in the construction industry, and apply basic geometry to measure them.
4 3 2 1 0 5. Demonstrate the ability to interpret information and instructions in both written and verbal form.
4 3 2 1 0 6. Demonstrate the ability to communicate effectively in on-the-job situations using verbal and written skills.
4 3 2 1 0 7. Perform physics skills to work with materials and load applications.

OCCUPATIONAL PROFILE RATING SCALE RUBRIC

Rating Scale (Occupational Profile)

4 - Exemplary Achievement:	Student possesses outstanding knowledge, skills or professional attitude. Works Independently.
3 - Proficient Achievement:	Student demonstrates good knowledge, skills or professional attitude. Requires limited supervision.
2 - Limited Achievement:	Student demonstrates fragmented knowledge, skills or professional attitude. Requires close supervision.
1 - Inadequate Achievement:	Student lacks knowledge, skills or professional attitude.
0 - No Instruction / Training:	Student has not received instruction or training in this area.