



Level One

MODULE 19101 – ORIENTATION

Task Number	Item	Date(s)	Recorded By
19101-1	Identify the six essential tools needed to start work.		
19101-2	Identify the assorted types of insulation materials on display.		

MODULE 19102 – TRADE RELATIONS

Task Number	Item	Date(s)	Recorded By
19102-1	Break into groups and conduct a typical scheduling meeting for a project with each of the trainees assuming different roles.		
19102-2	Take turns being a contractor and an inspector on a project.		

MODULE 19103 – TOOLS OF THE TRADE

Task Number	Item	Date(s)	Recorded By
19103-1	Describe the Appropriate Personal Protective Equipment and demonstrate the safety procedures for using power tools.		
19103-2	Identify all tools required and demonstrate a knowledge of the use of each tool.		

MODULE 19104 – MATERIAL HANDLING, STORAGE, AND DISTRIBUTION

Task Number	Item	Date(s)	Recorded By
19104-1	Identify materials and describe where the materials should be stacked.		
19104-2	Stack and cover insulation materials.		

MODULE 19105 – CHARACTERISTICS OF PIPE

Task Number	Item	Date(s)	Recorded By
19105-1	Identify iron pipe, copper tubing and stainless steel tubing.		
19105-2	Identify a piece of pipe insulation which will fit both a copper tubing size and an iron pipe size.		

MODULE 19106 – INSTALLING FIBERGLASS PIPE INSULATION

Task Number	Item	Date(s)	Recorded By
19106-1	Install fiberglass pipe insulation on straight run pipe with ASJ and SSL. Use butt strips on circumferential joints.		
19106-2	Install fiberglass pipe insulation at an outside pipe hanger using rigid inserts.		
19106-3	Install a tee.		
19106-4	Saddle a smaller size pipe insulation to a larger size.		

MODULE 19107 – INSULATING PIPE FITTINGS, VALVES, AND FLANGES

Task Number	Item	Date(s)	Recorded By
19107-1	Lay out by hand a 6 x 1½ mitered elbow and apply to the piping mock up.		
19107-2	Lay out by hand a tee and install.		
19107-3	Lay out and install a flanged valve for a cold service application.		
19107-4	Insulate a screwed fitting with insulation cement.		

Level Two

MODULE 19201 – INSTALLING FLEXIBLE FOAM INSULATION

Task Number	Item	Date(s)	Recorded By
19201-1	Identify the tools used to apply flexible foam insulation.		
19201-2	Install flexible foam pipe insulation.		
19201-3	Cut and install flexible foam insulation for fittings, valves, and flanges.		
19201-4	Cut and install flexible foam insulation for equipment and air ducts.		

MODULE 19202 – INSTALLING BLANKET INSULATION FOR DUCTS

Task Number	Item	Date(s)	Recorded By
19202-1	Cut and install two pieces of flexible fiberglass blanket insulation on the duct mock-up using the staple-stitch method. Seal butt laps with tape.		
19202-2	Seal butt laps on flexible blanket insulation using the mastic method and the adhesive method.		
19202-3	Insulate a section of the duct mock-up that includes a run-out.		

MODULE 19203 – INSTALLING BOARD INSULATION FOR DUCTS

Task Number	Item	Date(s)	Recorded By
19203-1	Identify all tools needed to install fiberglass board insulation including attachments.		
19203-2	Apply insulation weld pins to ductwork.		
19203-3	Apply fiberglass board insulation to straight duct and seal all joints with tape.		
19203-4	"Vee" cut, lay out, and install board insulation for a 12-inch round lateral.		

MODULE 19204 – INSTALLING CALCIUM SILICATE/EXPANDED PERLITE PIPE INSULATION

Task Number	Item	Date(s)	Recorded By
19204-1	Identify all tools needed to install calcium silicate/expanded perlite pipe insulation.		
19204-2	Cut and attach pipe insulation using the staggered joint method of installation.		
19204-3	Install an outer layer over the layer of insulation applied in exercise #2; stagger all joints; and band the outer layer in place using pistol grip banders.		

MODULE 19205 – INSTALLING MINERAL WOOL INSULATION

Task Number	Item	Date(s)	Recorded By
19205-1	Set up a pin welder and gun to shoot 10 gauge, copper coated pins, 12" O.C.		
19205-2	Demonstrate a knowledge of proper safety procedures and proper welding techniques.		
19205-3	Apply "V" groove pipe insulation to the piping mock-up.		
19205-4	Apply metal mesh blankets to the equipment mock-up.		

MODULE 19206 – INSTALLING RIGID FOAM AND CELLULAR GLASS INSULATION

Task Number	Item	Date(s)	Recorded By
19206-1	Insulate the piping mock-up with polystyrene insulation for cold service.		
19206-2	Insulate the piping mock-up with cellular glass pipe insulation for cryogenic service. Use all of the procedures required for this type of installation.		

MODULE 19207 – INSTALLING BOARD AND BLOCK INSULATION

Task Number	Item	Date(s)	Recorded By
19207-1	Using the vessel mock-up, determine the number of courses of block, the number of lags, and the angle required on the lags. Assume an insulation thickness of 2 inches.		
19207-2	Insulate the sidewall of the vessel mock-up using lags calculated from item 1. Be sure to include the use of a choker for a manway cover tie-off.		
19207-3	Insulate the bottom head of the vessel mock-up.		

MODULE 19208 – CEMENT AND FABRIC FINISHES AND MASTICS

Task Number	Item	Date(s)	Recorded By
19208-1	Insulate a screwed fitting with high-temperature insulation cement.		
19208-2	Insulate a calcium silicate 90-degree elbow with one coat of cement.		
19208-3	Apply a resin-based mastic and glass fab to the elbow in item 2.		
19208-4	Apply joint seal to pipe insulation to be used in cold service.		

MODULE 19209 – PLUMBING SYSTEMS

Task Number	Item	Date(s)	Recorded By
19209-1	Identify the parts of a distribution system.		
19209-2	Identify the steps that cold water goes through prior to being distributed in the pipe system.		

MODULE 19210 – CHILLED AND HOT WATER HEATING SYSTEMS

Task Number	Item	Date(s)	Recorded By
19210-1	Identify the systems that have been covered in this module in an actual equipment room.		

Level Three

MODULE 19301 – TRADE MATH

Task Number	Item	Date(s)	Recorded By
19301-1	Using a sample blueprint, use a scale ruler to convert drawing dimensions to full-size dimensions.		
19301-2	Calculate the square footage of insulation required for various lengths of round and rectangular ductwork.		
19301-3	Bisect a given angle.		
19301-4	Given a temperature of 75°F, calculate the temperature in Celsius.		
19301-5	Given a temperature of -50°C, calculate the temperature in Fahrenheit.		

MODULE 19302 – AIR DUCT SYSTEMS

Task Number	Item	Date(s)	Recorded By
19302-1	Using an unlabeled drawing of a low-pressure duct system, label the various components of the system.		
19302-2	Using an unlabeled drawing of a medium- or high-pressure duct system, label the various components of the system.		

MODULE 19303 – THEORY OF HEAT TRANSFER AND MOISTURE EFFECTS

Task Number	Item	Date(s)	Recorded By
19303-1	Find the K factors of the following materials at 100°F mean temperature using the K factor chart: <ul style="list-style-type: none">• Cellular glass• Mineral fiber• Elastomeric• Polyurethane		
19303-2	Apply a vapor barrier to pipe insulation on a mock-up.		

MODULE 19304 – ADHESIVES AND THEIR USES

Task Number	Item	Date(s)	Recorded By
19304-1	Install fiberglass pipe insulation with a self-sealing lap system.		
19304-2	Install fiberglass pipe insulation with a field-applied adhesive.		
19304-3	Use a general purpose adhesive to apply insulation anchors to ductwork.		

MODULE 19305 – STEAM, CONDENSATE, AND PROCESS WATER SYSTEMS

Task Number	Item	Date(s)	Recorded By
19305-1	Identify all elements of a steam system.		
19305-2	Identify all elements of a condensate return system.		

MODULE 19306 – LARGE BOILERS, BREECHINGS, PRECIPITATORS, AND APPARATUS

Task Number	Item	Date(s)	Recorded By
19306-1	Using the unlabeled diagram of a large boiler, identify the major parts.		
19306-2	Using the unlabeled diagram of a precipitator, identify the major components.		
19306-3	Identify at least five of the ten general guidelines for the storage and handling of materials at a boiler insulation project.		

MODULE 19307 – REFRIGERATION AND CRYOGENIC SYSTEMS

Task Number	Item	Date(s)	Recorded By
19307-1	Label an unmarked diagram of a refrigeration cycle.		
19307-2	Label an unmarked diagram of an ammonia refrigeration system.		

MODULE 19308 – SPECIALIZED INSULATION SYSTEMS

Task Number	Item	Date(s)	Recorded By
19308-1	Identify the methods and materials used to insulate refrigerant lines and condensate drains.		
19308-2	Identify the methods and materials used to insulate walls, ceilings, and floors.		

MODULE 19309 – BLUEPRINTS AND SPECIFICATIONS

Task Number	Item	Date(s)	Recorded By
19309-1	Using a sample set of drawings, identify: <ul style="list-style-type: none">• Plan view• Elevation view• Isometric• Flow diagram		
19309-2	Using a sample specification, identify: <ul style="list-style-type: none">• The type of base, securement, and finish materials required for the job.• The method of application for these materials.• The use of any approved alternate procedures or materials.		

MODULE 19310 – JACKETING FABRICATION — PIPING AND FITTINGS

Task Number	Item	Date(s)	Recorded By
19310-1	Using a piping mock-up with the insulation installed, apply a two-piece metal elbow, straight run aluminum jacket, a metal tee, and a terminus bevel.		
19310-2	Lay out a 14 x 2 gored elbow. Cut the gores out and apply the proper beading and crimping. Apply the gores to the piping mock-up.		
19310-3	Apply PVC jacketing to straight run piping using an adhesive and nylon bands. Finish the fittings with mastic fab and mastic.		

MODULE 19311 – JACKETING FABRICATION — VESSELS AND EQUIPMENT

Task Number	Item	Date(s)	Recorded By
19311-1	Using the vessel mock-up, install roll-type jacketing using screws and bands for securement.		
19311-2	Using the vessel mock-up, install sheet jacketing using screws and bands.		
19311-3	Using the vessel mock-up, lay out and install a gored head.		

MODULE 19312 – SHEET METAL LAGGING

Task Number	Item	Date(s)	Recorded By
19312-1	Using a mock-up, flash a top to side juncture.		
19312-2	Using a mock-up, flash an inside vertical corner.		
19312-3	Using a mock-up, flash a sidewall offset detail.		