



Level One

MODULE 19101 - ORIENTATION

1. Explain what insulation is and the basic uses of insulation.
2. Understand the history of insulation.
3. Identify some tool requirements and their uses.
4. Identify some systems that require insulation.
5. Identify who designs the required insulation for different systems.
6. Explain what an estimate is used for in a project.
7. Identify some of the types of insulation materials used.
8. Explain the difference between commercial and industrial plants.
9. Explain who subcontractors and general contractors are.
10. Explain who owners are.
11. Explain what energy conservation is.

MODULE 19102 - TRADE RELATIONS

1. List the various types of contracts.
2. Explain how a construction team works together to complete a project.
3. Explain the work an insulation contractor performs.
4. Explain what happens when poor communications between trades takes place.
5. Identify some of the specific areas that would make insulation application difficult.
6. Identify what is important upon the first day of assignment on the job site.

MODULE 19103 - TOOLS OF THE TRADE

1. Identify specific tools required in the insulation trade.
2. Choose the correct tool for the specific application.
3. Demonstrate the procedures for the care of personal hand tools.
4. Demonstrate the proper usage of personal hand tools.
5. Explain the general safety rules for hand tools.
6. Explain how and where personal tools should be kept when not in use at the job site.

MODULE 19104 - MATERIAL HANDLING, STORAGE, AND DISTRIBUTION

1. Explain how to receive materials.
2. Explain how to store materials outside.
3. Separate materials for easy usage when needed.
4. Explain why certain materials should be stored inside.
5. Describe where excess materials should be placed.
6. Describe what happens to boxes of materials when not kept dry.

MODULE 19105 - CHARACTERISTICS OF PIPE

1. Identify the various types of pipe.
2. Understand why different pipe is used for certain services.
3. Understand the relationship between pipe size and sizes of insulation.
4. Understand what heat traced pipe is.
5. Understand thermal expansion for hot systems.
6. Describe the various accessories in pipe systems.
7. Achieve greater insulation thickness using different sizes of piping insulation.

MODULE 19106 - INSTALLING FIBERGLASS PIPE INSULATION

1. Describe the basic characteristics of fiberglass pipe insulation.
2. Identify and use the proper tools for application.
3. Properly install ASJ jacket and butt strips with or without the use of staples.
4. Make required measurements on pipe for the proper installation of pipe insulation and jacket.
5. Install fiberglass insulation on pipe at contact type hangers.
6. Make proper cuts in fiberglass pipe insulation for installation on pipe where several cut-outs are required, such as pipe with branch lines located close to each other.
7. Trim out insulation for pipe couplings, welds and other obstructions.
8. Install rigid inserts at pipe hangers when fiberglass pipe insulation is being installed on pipe.

MODULE 19107 - INSULATING PIPE FITTINGS, VALVES AND FLANGES

1. Identify different types of pipe fittings, valves and flanges and explain the insulation requirements for each
2. Cut and install mitered segments of insulation to pipe elbows.
3. Cut insulation for application to flanged valves.
4. Install insulation on pipe flanges.
5. Cut and install plug 90 degree ells.

Level Two

MODULE 19201 - INSTALLING FLEXIBLE FOAM INSULATION

1. Understand the basic characteristics of flexible foam insulation.
2. Identify and use the proper tools for applications.
3. Install flexible foam pipe insulation.
4. Cut and install flexible foam insulation for fittings, valves, and flanges.
5. Cut and install flexible foam insulation for equipment and air ducts.

MODULE 19202 - INSTALLING BLANKET INSULATION FOR DUCTS

1. Identify the fundamental characteristics of fiberglass blanket insulation.
2. Properly apply fiberglass blanket insulation to ducts and apparatus.
3. Vapor seal blanket insulation facings.
4. Recognize and better understand terminology used in the insulation industry.
5. Identify the tools needed to apply fiberglass blanket insulation.

MODULE 19203 - INSTALLING BOARD INSULATION FOR DUCTS

1. Apply fiberglass board insulation to ducts and casings.
2. Accurately cut fiberglass board insulation to fit over standing seams and stiffeners on ductwork.
3. Apply a vapor-tight seal to board insulation on ducts and casings.
4. Cut and install fiberglass board insulation to round/oval ducts.
5. Recognize and define the terminology used in the insulation industry.
6. Identify the tools needed to apply fiberglass board insulation.

MODULE 19204 - INSTALLING CALCIUM SILICATE/EXPANDED PERLITE PIPE INSULATION

1. Describe the basic characteristics of calcium silicate/expanded perlite pipe insulation.
2. Handle and store calcium silicate/expanded perlite to avoid breakage and damage.
3. Identify and use the proper tools for application.
4. Make accurate cuts in calcium silicate/expanded perlite pipe insulation.
5. Install a single layer of calcium silicate/expanded perlite pipe insulation on piping using wire or bands.
6. Install double layers of calcium silicate/expanded perlite pipe insulation when required.

MODULE 19205 - INSTALLING MINERAL WOOL INSULATION

1. Identify and use specific tools for installing mineral wool insulation.
2. Recognize the various forms of mineral wool.
3. Understand measuring requirements.
4. Understand cutting and scoring methods.
5. Understand the various attachments used.
6. Understand and perform installation methods.
7. Understand the sealing requirements.
8. Understand the characteristics of welded pins, stick pins, and clips.
9. Use and maintain pin welding equipment.

MODULE 19206 - INSTALLING RIGID FOAM AND CELLULAR GLASS INSULATION

1. Understand the basic characteristics of rigid foam plastic and cellular glass insulations.
2. Identify and use the proper tools for application.
3. Handle and store rigid foam insulation.
4. Measure rigid foam plastic and cellular glass insulation.
5. Make accurate cuts in rigid foam plastic and cellular glass installation.
6. Install rigid foam plastic and cellular glass insulation.
7. Seal rigid foam plastic and cellular glass insulation.
8. Understand cryogenic installation methods.
9. Understand expansion joints, contraction joints, and vapor stops.

MODULE 19207 - INSTALLING BOARD AND BLOCK INSULATION

1. Identify and use specific tools to install board and block insulation.
2. Know various forms of board and block insulation.
3. Measure board and block insulation.
4. Score, bevel, and cut board and block insulation.
5. Install board and block insulation.
6. Paint board and block insulation.

MODULE 19208 - CEMENT AND FABRIC FINISHES AND MASTICS

1. Identify and use specific tools for cement and fabric finishes.
2. Identify types of cements.
3. Identify types of fabrics and mastics.
4. Understand the limitations of cements.
5. Understand the limitations of fabrics and mastics.
6. Install cement and fabric finishes and mastics.
7. Perform proper finishing techniques.
8. Perform cleanup and protection procedures for cement.

MODULE 19209 - PLUMBING SYSTEMS

1. Identify the elements of a typical cold water plumbing system.
2. Identify the elements of a typical hot water plumbing system.
3. Identify the various types of drainage systems in buildings.
4. Understand what type of insulation is required on plumbing systems and why.
5. Identify typical piping hookups.

MODULE 19210 - CHILLED AND HOT WATER HEATING SYSTEMS

1. Identify the elements of chilled water systems.
2. Identify the elements of hot water heating systems.
3. Identify the elements of dual-temperature systems.
4. Recognize the types of pipes used in various systems.
5. Explain which systems require insulation.
6. Identify the equipment used in various systems.

Level Three

MODULE 19301 - TRADE MATH

1. Use a folding rule and tape measure to determine the quantity of insulation required for a job.
2. Use a scale ruler to convert drawing dimensions to full-size dimensions.
3. Add and subtract mixed numbers.
4. Convert fractions to decimals.
5. Convert inches to feet and feet to inches.
6. Bisect angles.
7. Define radius, circumference, diameter, and pi.
8. Calculate surface areas of objects when given formulas and measurements.
9. Convert Fahrenheit to Celsius and Celsius to Fahrenheit.

MODULE 19302 - AIR DUCT SYSTEMS

1. Define the terminology used in the industry.
2. Identify the functions of various air ducts in buildings.
3. Explain the differences between high-, medium-, and low-pressure duct systems.
4. Explain which components of air duct systems are or are not insulated and why.
5. Recognize and identify the functions of common air handling system equipment.

MODULE 19303 - THEORY OF HEAT TRANSFER AND MOISTURE EFFECTS

1. Describe the basic methods of heat transfer.
2. Relate the basic principles of moisture migration.
3. Compare the efficiency ratings of various types of insulating materials in order to select the best material for the application.

MODULE 19304 - ADHESIVES AND THEIR USES

1. Identify various types of adhesives and list the most common applications of each type.
2. Describe the proper storage and application procedures for factory-applied jacket adhesive.
3. Describe the general application method for contact adhesive.
4. Explain how to apply anchors using general purpose adhesive.
5. List two methods of applying lagging adhesive.

MODULE 19305 - STEAM, CONDENSATE, AND PROCESS WATER SYSTEMS

1. Identify steam and condensate piping in buildings.
2. Understand the need for insulated process pipe systems in buildings.
3. Recognize the various pressures and temperatures of steam systems.
4. Understand the relationships between the equipment and steam systems in buildings.

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

1. Describe different types of boilers and their insulation requirements.
2. Identify various sections of large boilers and understand their insulation requirements.
3. Identify insulation requirements on breechings from large boilers.
4. Identify precipitators and other apparatus relating to large boilers.

MODULE 19307 - REFRIGERATION AND CRYOGENIC SYSTEMS

1. Identify refrigeration piping in refrigeration and air conditioning systems.
2. Identify ammonia piping in low-temperature storage buildings.
3. Identify systems where cryogenic piping may be used.
4. State the conditions under which refrigerant lines must be insulated.

MODULE 19308 - SPECIALIZED INSULATION SYSTEMS

1. Define a prefabricated panel system.
2. Explain where prefabricated conduit systems are used on underground pipe and which portions may require field insulation.
3. Explain double-walled vacuum systems as used in cryogenic temperature applications.
4. Explain where refractory-type insulation is used.
5. Describe the use of fireproofing materials in buildings.
6. List the types of insulation used in soundproofing applications.

MODULE 19309 - BLUEPRINTS AND SPECIFICATIONS

1. Interpret blueprints and architect's plans to identify insulation requirements.
2. Use blueprints and plans to verify correct installation of insulation.
3. Interpret specifications.
4. Describe a shop drawing.
5. Describe an as-built and the steps required to develop it.
6. Perform basic takeoff procedures.

MODULE 19310 - JACKETING FABRICATION – PIPING AND FITTINGS

1. Identify the different types of jacketing used for piping.
2. Identify the different gauges or thicknesses used for piping.
3. Explain the application procedures used for straight piping.
4. Identify the different types of fittings that can receive jacketing.
5. Perform the application procedures for jacketing on fittings.
6. Identify the tools required for layout and installation of jacketing.
7. Explain the layout procedures and how to install fitting jacketing.
8. Identify and apply the different methods of securement for jacketing.

MODULE 19311 - JACKETING FABRICATION – VESSELS AND EQUIPMENT

1. Describe the different types of jacketing materials used for vessels and equipment.
2. List the different thicknesses and gauges of jacketing materials.
3. Know the different areas of equipment which can receive jacketing materials.
4. Demonstrate the layout procedures for heads, flanges, reducers, and specialty items.
5. Demonstrate the installation procedures for equipment jacketing.
6. List the securements used for jacketing materials.

MODULE 19312 - SHEET METAL LAGGING

1. Identify and use specific sheet metal tools.
2. Know the limitations of metal.
3. Relate measuring requirements.
4. Explain cutting and shaping methods.
5. List various attachments used.
6. Explain installation methods.
7. Identify proper flashing and sealing techniques.