CTE Frameworks - Heating, Ventilation, Air Conditioning, and Refrigeration Equipment List

## Examples of Equipment

* 80% gas furnaces
* 90% gas furnaces
* 80% oil boiler/furnace
* ¼ Hp to 5 Hp semi-hermetic refrigeration condensing units w/ matching evaporator coils
* 24,000 BTU/hr to 60,000 BTU/hr Air-Conditioning condensing units w/matching air-handlers
* Self-contained rooftop heating / cooling units
* Ductless heat pump
* High-Efficiency Gas Boiler
* Heat Pump System (indoor/outdoor)
* Oil Burner
* Self-contained refrigeration unit
* Remote condenser refrigeration unit with evaporator coil

### Tool List

* Flaring Tool (Flareblock & Yoke)
* 3/8" Drill Bit
* Flathead Screw Drivers - Klein or equivalent quality
* Phillip's Screw Drivers - Klein or equivalent quality
* Flare Block & Yoke Set
* Flaring Wrench Set
* Saw-All Blades 18T @ 4" 5/pkgs or 25 blades
* All Purpose Bi-Metal Saw-All Blades / Metal # 6"
* Soldering Gun Kit
* 1/4" Nut Driver
* 5/16" Nut Driver
* Nut Driver Kit 7 pc
* Multi Tubing bender (up to 3/8")
* #2 Phillip's Drive Head Insert Bit
* 1/4" Magnet Drive Screw Chuck
* 5/16" Magnet Drive Screw Chuck
* Digital Multimeter
* Digital Multi Meter Test Leads
* Digital Clamp-on Amprobe or equivalent
* B-tank Acetylene/Propane/MAPP Gas with matching regulators
* Oxy-Acetylene Outfit with cutting/brazing/welding accessories
* Service Wrench (3/16,1/4, 5/16, 3/8)
* Refrigerant Leak Detector (electronic)
* Thermistor Vacuum Gauge
* Stubby Screwdriver (Klein or equivalent)
* Stubby Phillips Screwdriver (Klein or equivalent)
* Heavy-Duty Utility Knife
* Tubing Cutter 1/8 to 1-1/8
* (Imp) Tubing Cutter 1/8 to 3/4
* Drill Index
* Drill Index - 1/4-5/8
* Manifold Gauge set w/6' hoses for each refrigerant
* HD Cutting Wheels
* Flints for Striker (Fiction Lighter) Pkgs
* Access Valve Core Remover & Installer (Robinair or equivalent)
* Torpedo Level
* 3/8" Swaging Tool
* 1/4" Swaging Tool
* Nitrogen Tank
* Nitrogen Regulator
* Turbo Torch Adjustable Regulator (3/8" for B-Tank)
* Two -Stage Vacuum Pump 2CFM
* Offset Screwdriver Phillips
* Hose Coupler Gasket 10 Pkg
* Digital Thermometer
* Digital Solar Powered Thermometers - Range (-40f to 230f)
* Digital Thermometer
* BX Armor Cable Cutter
* Bullet 3 in 1 Tap Valve (1/4", 5/16", 3/8")
* 9 Piece 12 PT Combo Wrench Set
* Max Flow Combination Oil Pump
* Electronic refrigerant leak detector
* Hermetic Analyzer
* Wire Strippers for stranded wire
* Step Bit (Vari-Bit) - 1/8" - 1/2"
* Turbo Tip # A-3
* Turbo Tip # A-8
* Turbo Tip # A-5
* 7" Diagonal-Cutting pliers
* 9" Lineman's Pliers
* 8" Adjustable Wrench
* 6” Adjustable Wrench
* Combination Open-ended Wrenches - 7/16 -1/2 - 9/16 - 5/8 -11/16 - 3/4
* 10" Channel Locks Pliers (WATER PUMP PLIERS)
* 7" Locking Pliers (curved jaw)
* All-purpose Electrician's tool
* 9-Piece Hex Key Set (folding) - 5/64 - 1/4
* 12" Long Arm Hex Key Set - 5/64 - 1/4
* 12" 16 Oz Ball-Pein Hammer
* 2"x3" Rectangular Telescoping Inspection Mirror
* Flashlight
* 10" Aluminum Pipe Wrench
* 14" Aluminum Pipe Wrench
* 18volt Cordless Drill
* Needle Nose Pliers (8 -5/16" Length)
* Valve Wrench for B or MC tanks
* 6' Fiberglass Ladder 1AA 375lb
* 8' Fiberglass Ladder 1AA 375lb
* High Tension Hacksaw
* Hack Saw Blades
* Heavy Duty Bench Vise
* Locking pinch Off Tool
* Putty Knife 2"
* Hand Riveter
* Hex Key Set
* 25ft x 1" Tape Measures
* Romex Wire Stripper
* 3-Wire extension Cord 25' 15 Amps
* 1/4" Ratchet Set
* 1/2" Ratchet Set
* 10" File - half round w/handle
* 10" File - Triangular w/handle
* Imp Triple Head Tube Bender
* 7-piece Spring Type Tube Bender Kit
* PEX Expansion/Crimp Kit
* Copper Press Tool Kit
* Electronic refrigeration scale
* Refrigerant Recovery Machine
* Standard Caulking Gun
* Electronic Refrigerant Gauges
* DOT Refrigerant Recovery Tank 50lb
* DOT Refrigerant Recovery Tank 30lb
* Level Action Grease Gun
* Heavy Duty Hot Water Hose 50'
* Digital Torque Wrench
* Combustion Efficiency Test Kit
* Manometer
* Velometer
* Psychrometer
* Reciprocating Saw
* Pipe Threading Equipment
* Right Angle Drill
* Hammer Drill
* Sheet Metal Tool Kit
* Hole Saw Kit
* Paddle Bit Set
* Hydraulic Punch Kit
* EMT Bender
* Eccentric/Orbital Cone Flaring Tool
* Fluorescent Liquid Leak Detector Kit
* Pressure Washer
* Pump Sprayer

### Miscellaneous Supplies

* Recommended - Based on 15 students per class.
* "Epox-O-Leak"
* Silicone Caulk
* 3/8" ID clear vinyl tubing (1 Roll or 100 ')
* 1/4" ID clear vinyl tubing (1 Roll or 100 ')
* Oil Spill Absorber 50 lb. Bag
* Gray Duct Tape 2” \* 60 ft. Cloth Type
* Condensate Pump 115 volt
* Permagum Sealout
* Wire Marker Packs
* B-Line / Superstrut Channel S Style (Deep) 10' Lengths
* Wood Screws # 8 x 1/2” Phillips Head
* Wood Screws # 8 x 2” Phillips Head
* Hex Nuts 3/8 large
* 1/8" x 1" Fender Washers
* 1/4" x 1-1/4 Fender Washers
* Plated Flat Washers 3/8
* 7/8Two Hole Clips--piece
* 3/8 F&M Plates
* Refrigeration Hose Gaskets (1/4 Tubular) 10 Pkg
* AAA Batteries
* AA Batteries
* 9 Volt Batteries
* Nylon Cable Wire Ties 8" or similar (100 per Package)
* 1/4" Screw Anchor Kit
* WD- 40 Lubrication Oil Cans
* Non Hardening Silicone (case)
* Pipe Dope Compound (small can)
* Insulated female Disconnect10-12 AWG
* Insulated female Disconnect 14-16 AWG
* Hose Clamps # 6
* Hose Clamps # 8
* Hose Clamps # 10
* Leak Lock Joint Sealer
* Teflon Tape - 1/2"
* Teflon Tape - 3/4"
* Abrasive Cloth (25 yards)
* Sof-Flame Handle
* Snappy Adapter (Quick Disconnect for TurboTorch)
* Friction Lighter (Striker)
* 11 Oz Spray Can Penetrating Oil
* 14 Oz Multi-purpose grease cartridge
* Flame Mat
* 3/8 Threaded Rod 6' Galv.
* Misc. Copper Fittings, Tubing and Hangers
* Misc. Black Steel Fittings, Pipe and Hangers
* Misc. PVC Fittings, Pipe and Hangers
* Misc. PEX Fittings, Pipe and Hangers
* Misc. Brass Fittings
* Misc. Venting Material
* Misc. Industry Standard Refrigerants and Oils
* Misc. Computer Software and Hardware currently used in industry
* Misc. Soldering/Brazing Materials and Supplies
* Misc. Electrical Materials and Supplies
* Misc. HVAC-R Electrical/Pressure/Temperature Controls
* Misc. Refrigeration Line Components
* Misc. Access Valves
* Lock Out Tag Out Kit
* Misc. Safety Components
* Misc. Pipe Insulation
* Misc. Duct Insulation
* Misc. Hydronic Components and Controls
* Misc. Oil Heat Components
* Electronic (computer program) Manual J calculation – i.e. Wright Soft

* [Electronic drawing program – i.e MS Vision [JS1]](file:///C:\\Users\\Russell\\Downloads\\Addendum%20A%20Equipment%20and%20Supplies%20(2).xlsx" \l "RANGE!_msocom_1)