

Unit/Standard Number	 <p data-bbox="327 142 621 207">pennsylvania DEPARTMENT OF EDUCATION</p> <p data-bbox="982 155 1625 181" style="text-align: right;"><u>High School Graduation Years 2010, 2011 and 2012</u></p> <p data-bbox="443 245 1453 440" style="text-align: center;">Heating, Air Conditioning, Ventilation and Refrigeration Maintenance Technology/Technician CIP 47.0201 Task Grid</p>	Proficiency Level Achieved: (X) Indicates Competency Achieved to Industry Proficiency Level
Secondary Competency Task List		
100	INTRODUCTION TO HVAC	
101	Identify HVAC systems.	
102	Describe career opportunities in the HVAC profession.	
103	Demonstrate awareness of the occupational requirements.	
104	Explain the class rules and the rational behind them.	
105	Describe and display positive student/teacher and employer/employee, student/worker attributes.	
106	Identify basic refrigeration systems.	
200	BASIC SAFETY	
201	Identify causes of job site accidents and measures to prevent them.	
202	Identify job site hazards and describe measures to prevent them from occurring.	
300	CONSTRUCTION MATH	
301	Demonstrate Proficiency in Math as it relates to HVAC/R.	
400	TOOLS FOR HVAC/R	
401	Identify and Safely Use Basic Hand Tools Used in the Trade.	
402	Identify and Safely Use Basic Power Tools Used in the Trade.	
500	BLUEPRINT READING	
501	Identify types of blueprint plans.	
502	Read and Interpret blueprint plans.	

Unit/Standard Number	 <p data-bbox="327 142 623 207">pennsylvania DEPARTMENT OF EDUCATION</p> <p data-bbox="982 155 1625 183" style="text-align: right;"><u>High School Graduation Years 2010, 2011 and 2012</u></p> <p data-bbox="443 245 1453 440" style="text-align: center;">Heating, Air Conditioning, Ventilation and Refrigeration Maintenance Technology/Technician CIP 47.0201 Task Grid</p>	Proficiency Level Achieved: (X) Indicates Competency Achieved to Industry Proficiency Level
600	BASIC COMMUNICATION	
601	Demonstrate Reading, Writing, Listening, and Speaking Skills.	
602	Complete a Resume and Mock Interview.	
700	BASIC EMPLOYABILITY	
701	Demonstrate Employability Skills.	
702	Demonstrate Interpersonal Skills.	
800	PIPING PRACTICES	
801	Identify Piping Material.	
802	Select, Measure, Cut, and Ream Piping and Tubing.	
803	Assemble Piping Projects and Pressure Test According to Trade Standards.	
804	Identify and assemble PVC pipe and fittings.	
805	Assemble copper tubing projects and pressure test according to trade standards.	
806	Solder copper tubing.	
807	Braze and silver solder ACR Tubing.	
808	Identify and demonstrate proper use of fittings and tools for steel (black) pipe.	
809	Cut, ream, thread and assemble steel (black) pipe.	
810	Assemble CSST (Corrugated Stainless Steel Gas Tubing) Projects.	
900	BASIC ELECTRICITY	
901	Describe methods of producing electricity using appropriate terms.	
902	Calculate basic electrical quantities using Ohm's law.	
903	Explain how magnetism is used in different HVAC components.	

Unit/Standard Number	 <p data-bbox="327 142 621 204">pennsylvania DEPARTMENT OF EDUCATION</p> <p data-bbox="982 155 1625 181" style="text-align: right;"><u>High School Graduation Years 2010, 2011 and 2012</u></p> <p data-bbox="443 245 1451 440" style="text-align: center;">Heating, Air Conditioning, Ventilation and Refrigeration Maintenance Technology/Technician CIP 47.0201 Task Grid</p>	<p data-bbox="1711 185 1971 380" style="text-align: center;">Proficiency Level Achieved: (X) Indicates Competency Achieved to Industry Proficiency Level</p>
904	Identify Safe Electrical Practices.	
905	Recognize and draw various types of electrical schematics and symbols.	
906	Demonstrate proper wiring techniques.	
907	Demonstrate electrical testing.	
908	Wire series circuit, parallel circuit, and series / parallel circuit.	
909	Install electric disconnects, circuit breakers and fuses.	
910	Identify and test capacitors.	
911	Identify electrical motors and their applications.	
912	Recognize motor control protection and start devices.	
913	Recognize Electrical Codes.	
1000	INTRODUCTION TO COOLING	
1001	Measure temperature and pressure of a cooling system.	
1002	Calculate Superheat and Subcooling.	
1003	Locate and describe components of the basic refrigeration cycle.	
1004	Apply Pressure Temperature Charts for various refrigerants.	
1005	Describe the functions of compressors.	
1006	Describe the functions of condensers.	
1007	Describe the functions of evaporators.	
1008	Describe the functions of metering devices.	
1009	Identify secondary components used in the air conditioning and refrigeration industry.	
1010	Evaluate effects of airflow on system performance.	
1100	INTRODUCTION TO HEATING	

Unit/Standard Number	 <p data-bbox="327 142 621 204">pennsylvania DEPARTMENT OF EDUCATION</p> <p data-bbox="982 155 1625 181" style="text-align: right;"><u>High School Graduation Years 2010, 2011 and 2012</u></p> <p data-bbox="443 245 1453 440" style="text-align: center;">Heating, Air Conditioning, Ventilation and Refrigeration Maintenance Technology/Technician CIP 47.0201 Task Grid</p>	Proficiency Level Achieved: (X) Indicates Competency Achieved to Industry Proficiency Level
1101	Describe the principles of combustion.	
1102	Identify temperatures and pressures of a heating system.	
1103	Identify components of various heating systems.	
1104	Perform maintenance on a gas furnace.	
1105	Troubleshoot conventional / condensing gas heating equipment.	
1106	Identify oil heating equipment.	
1107	Install and adjust oil fired equipment.	
1108	Perform annual preventive maintenance on oil fired equipment.	
1109	Troubleshoot oil fired equipment.	
1110	Identify electric heating equipment.	
1111	Install heating/air conditioning thermostats according to manufacturer's standards.	
1112	Identify components and controls of steam heating systems.	
1113	Perform Combustion Analysis on oil and gas fired equipment.	
1200	AIR DISTRIBUTION SYSTEMS	
1201	Identify and sketch different types of duct systems.	
1202	Identify and describe the different types of duct system components.	
1203	Measure temperature, humidity and air velocities.	
1204	Determine velocity, static, and total air pressures in a system.	
1205	Determine airflow volume using velocity pressure method.	
1206	Perform basic duct fabrication functions.	
1300	INTRODUCTION TO HYDRONIC SYSTEMS	
1301	Describe hot –water heating system components.	

Unit/Standard Number	 <p data-bbox="327 142 621 204">pennsylvania DEPARTMENT OF EDUCATION</p> <p data-bbox="982 155 1625 181" style="text-align: center;"><u>High School Graduation Years 2010, 2011 and 2012</u></p> <p data-bbox="443 245 1451 440" style="text-align: center;">Heating, Air Conditioning, Ventilation and Refrigeration Maintenance Technology/Technician CIP 47.0201 Task Grid</p>	Proficiency Level Achieved: (X) Indicates Competency Achieved to Industry Proficiency Level
1400	LEAK DETECTION, EVACUATION, RECOVERY AND CHARGING	
1401	Locate refrigerant leaks using common types of leak detectors.	
1402	Perform refrigerant recovery.	
1403	Perform system evacuation and dehydration.	
1404	Determine when to charge with liquid versus vapor.	
1405	Weigh in correct system charge (when appropriate).	
1406	Charge systems using superheat method when appropriate (e.g., fixed restriction).	
1407	Charge systems using subcooling method when appropriate (e.g., TXV, AXV).	
1408	Demonstrate knowledge of EPA Section 608.	
1500	TROUBLESHOOTING GAS HEATING	
1501	Perform gas burner flame proving tests according to trade standards.	
1600	TROUBLESHOOTING COOLING	
1601	Identify control system components.	
1700	HEAT PUMPS	
1701	Explain heat pump modes of operation.	
1702	Identify and describe heat pump components.	
1800	COMPUTER FUNDAMENTALS	
1801	Identify components of a desktop computer.	
1802	Utilize the Internet for research.	