Program Information & Skill Alignment Chart for:
HVAC/R (Heating/Ventilation/Air Conditioning/Refrigeration – CIP Code 47.0201
Brownstown Campus

Form to be submitted to IU 13 with PIF

Program Description	This program has high standards to achieve throughout the year, with heavy emphasis of "hands on" practical experience as well as moderate levels of classroom theory on the many facets of HVAC. Students in this program will perform installation, service, maintenance and repair of different types of heating and cooling equipment. The students will perform the work mentioned with different types of piping materials, duct work materials, as well as working with live electrical controls, components, and motors.
Program Information (costs, certifications, uniform)	**Textbooks-** • NCCER Core Curriculum (Introductory Craft Skills) • NCCER Heating, Ventilating, and Air Conditioning (Level One) • NCCER Heating, Ventilating, and Air Conditioning (Level Two) *These textbooks will be provided to the students at no cost. The students will be responsible for any textbooks that become missing or damaged beyond normal wear & tear.* **Uniforms-** The students should plan on purchasing multiple t-shirts, sweatshirts and pants to comply with uniform cleanliness standards. The uniform shirts can be found and purchased on the school's web page at the bottom left under online store/uniform The HVAC/R students will need to purchase… • black t-shirts ($12) • long-sleeved t-shirts ($14) if they prefer • crewneck sweatshirts ($17) The students will need to purchase black "Dickies" work pants (or a similar style) from any retailer they choose. The HVAC/R students will also need to purchase leather work boots with a steel toe or hard composite toe protection. The boots must also have an Electrical Hazard (EH) rating or shock protection listed on the footwear. These work boots will cost anywhere between $100-$250 on average. **Tools-** The school will issue each student a tool kit that they will be responsible for until the completion of this program*. The student will replace or pay for any missing or damaged tools beyond normal wear & tear.* The HVAC program requires students who choose to participate in Advanced Placement Internship (API) or Cooperative Education (Co-op) to possess their own personal hand tools prior to their employment beginning. **Program Opportunities/Certifications –** • National Center for Construction Ed & Research/ABC Registration • ESCO Institute- EPA 608 Certification • OSHA-10 • TracPipe (Counter Strike Certification)

	• Gastite (Flash Shield+ Certification)	
Program Outline & Pathways	State Program of Study Task Outline • Introduction to HVAC/R • Basic Safety • Tools for HVAC/R • Blueprint Reading • Piping Practices • Basic Electricity • Introduction to Cooling • Introduction to Heating • Air Distribution Systems • Introduction to Hydronic Systems • Leak Detection, Evacuation, Recovery & Charging • Troubleshooting Heating • Troubleshooting Cooling • Heat Pumps • Computer Fundamentals • Career Readiness	Pathways • Residential New Construction HVAC Installer • Commercial New Construction HVAC Installer • Retrofit/Replacement HVAC Installer • Residential HVAC Service/Repair Technician • Commercial HVAC Service/Repair Technician • Pipe fitting • Duct Installer • HVAC Warehouse/Supply Worker • Sales • Manufacturing • Management/Supervisor • Business Owner • College/Post-Secondary Schooling
Other Information *Include Articulation Agreements*		

Student Name: _____ District: _____

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Educational and Physical Attributes	Program Expectations	Present Education Level and Current Supports
Program Safety / Physical Considerations	• Wear protective clothing and equipment for long periods of time • Lift 50 lbs. overhead • Work in all weather conditions • Work independently • Work with others • Take and carry out orders • Good eye/hand coordination • Quick reflexes • No fear of heights • No fear of working in close spaces • Physical strength and stamina	

	• Ascending and descending ladders	
Action/Need:		
Program Environment	• Theory room is connected to the lab, but separated from each other by a wall with windows and a door. • Theory and book work in temperature conditioned classroom • Fast paced lab work with high demand for quality and attention to detail • Exposure to hot humid conditions in lab • Exposure to cold temperatures in lab • Exposure to fully operational HVAC equipment and live electricity • Exposure to refrigerants, fumes, chemicals, solvents, oils, gases, flame, and sharp objects • Daily use of hand tools and power tools • Noisy environment (power tools, torches, hammering, people etc.) • Dusty environment (fiberglass, drywall dust, saw dust etc.) • Crowded work areas (people and equipment)	
Action/Need:		
Typical level of support	At CTC, we have itinerant IU13 support teachers and paraeducators. In the itinerant model, the support teachers have multiple programs and provide check-ins during the day. The itinerant model does not include co-taught classes where teachers are in classes for extended periods of time. IU13 paraeducators also support several teachers, spreading out their day between multiple programs. The learning center is available at scheduled times for testing accommodations, study/instructional groups, and work completion support. Since time there takes away from lab time, students are encouraged to use it strategically.	
Action/Need:		

Reading / ELA levels		
Action/Need:		
Writing Levels	• All homework and classroom assignments from text books will be hand written with pen and paper. • Ability to communicate in writing what was done • Preparation of customer estimates	
Action/Need:		
Math Levels Examples: An emergency fuel line must reach diagonally across a boiler room, corner to corner. The room is 40 ft. × 70 ft. How long must the fuel line be? ($A^2 + B^2 = C^2$) Determine the capacity, in gallons, of a hot water heater, whose height is 2 feet and whose diameter is 2 feet. (Formulas below) Cylinder Volume = π r2h Capacity (gals) = VOL(ft.3) × 7.5(gals/ft.3)	• Basic math and algebra skills are needed to perform many different tasks both in theory and during lab work • Pythagorean theorem • Use of formulas for area and volume are common	
Action/Need:		
Theory time	Theory times will vary from day to day. Depending on what is being covered, it can be anywhere from **one to three hours**.	

Action/Need:		
Homework	Homework is typically one or two book assignments given on a **weekly basis** throughout the school year. Occasional computer assignments will also be required.	
Action/Need:		
Lab Time	Lab time will vary from day to day. Depending on what is being covered, it can be anywhere from **three to six hours**. This program works in the lab the majority of the day. The student should be prepared to work with others as well as individually on many projects.	
Action/Need:		
Tests	• **Module Exams** (Testing will be conducted for each module that is completed as a homework assignment throughout the school year.) • **NOCTI** Written Pretest, written and hands on post-test • **EPA Certification** (October/November)	
Action/Need:		
Behavioral Expectations *Executive Function* *Organizational skills*	• Mandatory compliance with safety practices • Ability to take and follow directions • Respect (mutual between instructor and students) • "Can Do" attitude • Leadership Capabilities	

	• Ability to work independently • Teamwork Mindset • Good Attendance • 100% effort at everything • Aggressive Worker • Excellent clean-up/housekeeping skills • Quality Workmanship • Attention to detail • Ability to maintain mental focus during times of physical exertion	
Action/Need:		
Other *Technology skills specific to the program* *Additional skills that are valuable for program success.*	• Proficient use of school issued laptop. • Learn to access and communicate through email. • Learn to access and navigate our online teaching platform, "Canvas". • Obtain driver's license • Reliable transportation	
Action/Need:		

District Representative Signature _____ *Date* _____