



HEATING, VENTILATION, AND AIR CONDITIONING/REFRIGERATION (HVAC/R)

**Wisconsin Indianhead Technical College
32-601-1 Technical Diploma**

**2013
Program Review
and
Improvement Plan**

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Heating, Ventilation, and Air Conditioning/Refrigeration (HVAC/R)

32-601-1 Technical Diploma

Financial Aid Eligible

Program Overview

The air conditioning and refrigeration industry is one of the fastest growing occupations. This program will prepare students to design, install, service, maintain, and operate HVAC/R systems in residential, public, and light commercial buildings. The basic concepts of geothermal heating and cooling will be introduced. Students will be trained to service systems in residential homes, hospitals, government buildings, schools, hotels and motels, apartment buildings, and office buildings.

Campus:

Superior



Special Feature

This program is unique in the state.

Admission Requirements

Students in this program must:

- Complete application form and submit with fee (fee waiver may apply if previously submitted)
- Complete Accuplacer entrance assessment to determine placement (waiver may apply with acceptable alternative test scores and/or postsecondary degree completion)
- Complete admissions interview with a WITC counselor (above requirements should be completed prior to interview)

Student Profile

Students of this program should be able to:

- Learn mechanical principles and repair techniques
- Use good judgment
- Follow procedures carefully
- Handle and manipulate tools and equipment skillfully
- Assume responsibility for their work
- Adhere to required standards
- Adapt and handle a variety of duties and interruptions
- Work under pressure
- Move easily and lift 50 pounds
- Distinguish colors

Preparation for Admission

Students should strive to reach a comfort level in the following courses or skills:

- General Math/Algebra
- Science
- Communications
- Health/Human Relations

Program Outcomes

Employers will expect graduates of this program to be able to:

- Practice safe techniques when servicing and testing HVAC/R systems
- Troubleshoot HVAC/R systems
- Use tools and equipment to service and/or test HVAC/R systems
- Select equipment to install for an HVAC/R system
- Estimate HVAC/R repair cost and order parts
- Meet requirements for the EPA Refrigeration Certificate
- Interpret HVAC/R drawings
- Estimate a heating and cooling load
- Communicate HVAC/R service reports for customers

Collegewide outcomes and indicators will also be addressed to develop personal awareness, career effectiveness, and professionalism. See page 5 of the college catalog for a list of collegewide outcomes and indicators.

Career Outlook

Typical positions available after graduation include:

- Residential HVAC/R Technician
- Commercial HVAC/R Technician
- Industrial HVAC/R Technician
- Mechanical Contractor HVAC/R Technician
- Facilities HVAC/R Technician
- Wholesale Service Representative

With additional education and/or work experience, graduates may find other opportunities for employment:

- Energy Management Technician
- Business Owner HVAC/R
- Practice Engineering of HVAC/R Systems

Curriculum

Number	Course Title	Credits
Occupational Specific Courses		
10480105	Alternative Energy Overview	3
32601300	Air Conditioning Fundamentals ▲	2
32601301	Basic Mechanical Fundamentals ▲	3
32601302	Refrigeration Fundamentals ▲	2
32601303	Principles of AC/DC ▲	3
32601304	Heating Systems ▲	2
32601305	Electrical Controls and Systems	3
32601306	HVAC/R Print Reading ▲	2
32601307	Heating System Applications ▲	3
32601308	Electronic Energy Management ▲	3
32601309	Control Circuit Applications ▲	3
32601310	Sheet Metal Fabrication ▲	2
32601311	Hydronic Heating ▲	3
32601312	Refrigeration Applications ▲	3
32601313	HVAC/R Electronic Troubleshooting/Repair (WBL) ▲	2
32601314	Heat Load Estimation ▲	1
32601315	Geothermal Systems ▲	2
32890305	Applied Information Resources	2
		<hr/>
		44
Occupational Supportive/General Studies Courses*		
32804355	Math 355	3
32804364	Math 364 ▲	2
32801361	Applied Communications 1	2
32801363	Applied Communications 2 ▲	2
32809371	Applied Human Relations	2
		<hr/>
		11
PROGRAM REQUIREMENTS		55

▲ Requires a prerequisite and/or corequisite that must be completed with a grade point of 2.0 or better.

* See page 40 for General Studies course descriptions.

Course Descriptions

(See page 40 for General Studies course descriptions)

10480105

Alternative Energy Overview - Credits: 3

In this course, students will investigate the need for renewable energy systems and emerging careers in renewable energy. Students will examine the basic design, cost, and other considerations associated with photovoltaic, wind, hydro and biogas electrical generation systems. In addition, students will evaluate the basic design, costs, truths and myths associated with solar thermal, geothermal, and biomass heating and cooling systems and explore the production and use of alternative transportation fuels. Students will also perform a site assessment for the installation of a renewable energy system.

32601300

Air Conditioning Fundamentals - Credits: 2

Topics covered include air conditioning principles and terms, physical principles of air movement and humidity, methods of conditioning air for comfort and health, the proper use of psychrometers, dry bulb thermometers, hygrometers, pitot tubes, recorders, manometers and barometers, and the reading and interpretation of psychrometric charts and scales. **PREREQUISITE:** Admission to HVAC/R Plan.

32601301

Basic Mechanical Fundamentals - Credits: 3

This course is designed to introduce the learner to the basic fundamental skills necessary to work in the HVAC/R Industry. Instruction will be given in learning the various types of piping and tubing used in air conditioning, heating, and refrigeration; types of fittings, bending, brazing, soft soldering tubing, black iron pipe work, using hand tools, and the recognition and practice of safety procedures while working on heating, air conditioning, and refrigeration systems. **PREREQUISITE:** Admission to HVAC/R Plan.

32601302

Refrigeration Fundamentals - Credits: 2

Topics include refrigeration principles and terms, thermodynamic processes, refrigerants, vapor compression cycles, mechanical refrigeration system components, use of electrical controls, refrigeration applications, and refrigeration tools and materials. **PREREQUISITE:** Admission to HVAC/R Plan.

32601303

Principles of AC/DC - Credits: 3

This course provides an introduction to DC and AC electricity. The students will be able to perform basic resistance, current, voltage, and power calculations and measurements in both DC and AC circuits. Knowledge and use of test equipment will focus on multimeters and oscilloscopes. Critical-thinking skills are emphasized to develop competencies in problem solving and troubleshooting. This is a lab- and lecture-based course that provides hands-on and theoretical learning. **COREQUISITE:** 32804355 Math 355.

32601304

Heating Systems - Credits: 2

Topics include introduction to heat principles, temperature measurement, fuels and other sources of heat, combustion, basic heating systems, basic furnace design, gas furnace design and operation, venting of furnaces, chimney or exhaust gases, and system controls. **PREREQUISITE:** Admission to HVAC/R Plan.

32601305

Electrical Controls and Systems - Credits: 3

Topics in this course include basic electricity review, control circuits, symbols, diagrams, protection devices, transformers, relays, thermostats, single-phase motors, capacitors, control components, and troubleshooting ACR system wiring diagrams. Electrical experience equivalent to 32601303 Principles of AC/DC is recommended.

32601306

HVAC/R Print Reading - Credits: 2

Topics include print reading: understanding, interpreting, and utilizing architectural working drawings; safety procedures; drafting techniques; and lettering. **PREREQUISITE:** Admission to HVAC/R Plan.

32601307

Heating System Applications - Credits: 3

Topics include installation, start-up, and service of gas- and oil-fired heating equipment; air conditioning and air-to-air heat pump systems; and electrical and mechanical testing/analyzing of system components. **PREREQUISITES:** 32601301 Basic Mechanical Fundamentals and 32601304 Heating Systems.

32601308

Electronic Energy Management - Credits: 3

This course serves as an introduction to how a heating, venting, and air conditioning control system is used to operate a building's mechanical equipment so as to maintain the desired environmental conditions. **PREREQUISITE:** 32601309 Control Circuit Applications.

32601309

Control Circuit Applications - Credits: 3

Topics include control circuit terminology, measuring devices, and control systems. The principles of self-contained, electromechanical, and electronic-electric controls are examined and applied to control systems operation and design. **PREREQUISITE:** 32601305 Electrical Controls and Systems.

32601310

Sheet Metal Fabrication - Credits: 2

The layout and fabrication of a variety of sheet metal fittings. **PREREQUISITE:** 32601301 Basic Mechanical Fundamentals.

32601311

Hydronic Heating - Credits: 3

Topics include heating ignition systems, oil boiler installation and start up, venting of gas-fired boilers, heating with hot water, multiple boiler systems basics, and zoning hydronic heating systems. **PREREQUISITES:** 32601301 Basic Mechanical Fundamentals and 32601304 Heating Systems.

32601312

Refrigeration Applications - Credits: 3

Topics include domestic and commercial refrigeration systems, applications, installation, servicing, troubleshooting, heat loads and piping, controls, and special refrigeration components. **PREREQUISITES:** 32601300 Air Conditioning Fundamentals, 32601301 Basic Mechanical Fundamentals, and 32601302 Refrigeration Fundamentals.

32601313

HVAC/R Electronic Troubleshooting/Repair (WBL) - Credits: 2

This course is designed for the advanced student who has already completed the theoretical and basic hands-on classes. In this class the student will be responsible for troubleshooting and repairing a variety of HVAC/R equipment. The student will be required to diagnose the faulty equipment, select the proper replacement parts, return the equipment to a working condition, and prepare a detailed work order listing all work performed. **PREREQUISITE:** 32601309 Control Circuit Applications.

32601314

Heat Load Estimation - Credits: 1

This course will teach the student how to use "Manual I" from ACCA. The student will develop the skills to do residential heating and cooling heat loads. Students will calculate heat loss and also losses or gains due to infiltration, sun loads etc. The student will do calculations on actual buildings using ACCA industry standard form J-1. The student will also be pricing energy upgrades such as insulation, window improvements, etc. and calculating payback and fuel savings. **PREREQUISITE:** Admission to HVAC/R Plan.

32601315

Geothermal Systems - Credits: 2

This course is designed to introduce the student to the basic concepts of geothermal heating and cooling. Students will be introduced to the concepts of geothermal heating and cooling using geothermal pumps, ground source heat exchangers, indoor heat exchangers, connecting devices, and circulating fluid configurations and fusions. **PREREQUISITES:** 32601301 Basic Mechanical Fundamentals, 32601302 Refrigeration Fundamentals, and 32601305 Electrical Controls and Systems.

32890305

Applied Information Resources - Credits: 2

This course will allow the learner to develop skills in research, evaluation, selection, and preparation of information resources useful to their career area. Learners will use various information resources, including computer software applications to develop sound information research strategies. Learners will be exposed to ethical use of information, information provided by various methods and stored in various management formats, communicating by e-mail, developing search and selection of information resources, analysis, and use of results. This discussion- and lab-based course will use individual and group work to search and share information resources. Competencies learned in this course will be able to be applied in other courses within your program and will continue to be valuable in lifelong learning. You should have experience in keyboarding and basic computer skills for this course.

Gainful employment information is available at this link: <http://www.witc.edu/pgmpages/airhtgref/career.htm>. This information is provided as a federal requirement in an effort to help students make informed decisions related to the costs and potential employment in a chosen field.

Graduate Employment Information

(WITC Graduate Survey Responses 2010-2011; for most recent data, go to [witc.edu](http://www.witc.edu))*

Number of graduates	16	Number employed	11	% employed in WITC district	17%
Number of responses	15	Percent employed	100%	Range of yearly salary	\$20,790-\$51,996
Number available for employment	11	Employed in related field	6	Average yearly salary	\$31,978

career vision

800.243.9482

witc.edu

2013-2014

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TEAM MEMBERSHIP

ACADEMIC PROGRAM REVIEW PROFILE

Program Number & Name	
32-601-1 Heating, Ventilation, and Air Conditioning/Refrigeration (HVAC/R)	
Program Academic Dean	Title/Location
Mike Boyle	Academic Dean-Trade and Technical
Team Lead(s)	Title/Location
Frank Vidas	HVAC/R Faculty - Superior
Team Members	Title/Location
Amanda Hellman	Student Services Assistant – Superior
Amy Pozniak	HVAC/R Program General Education Instructor – Superior

Program Information:			
Capacity (new students admitted/year):		20	
Number of Faculty:	FT: 1	PT: 2	
Statewide Curriculum:	Yes? X	No?	
Number of Technical Studies Courses in each of the following delivery modes: (there may be duplication for courses offered in multiple modes)			
		<i>Classroom:</i>	18
		<i>Online:</i>	None
		<i>ITV/IP:</i>	None
		<i>In Person/Web Blended:</i>	None

Program Accredited by:	NA
Date of Last Accreditation	
Date of Next Accreditation	
Is a visit required? If so, when is the next visit?	
Program Licensed by:	NA
Date of Last Licensing:	
Date of Next Licensing:	
Is a visit required? If so, when is the next visit?	
Please list other program memberships:	Air Conditioning Contractors of America
	Refrigeration Service Engineers Society
	Mainstream Engineering

Note: The accreditation, licensing, and membership information listed above will be listed in the annual WITC Fact Book.

SELF-STUDY REPORT

SELF-STUDY SUMMARY REPORT

Program Information	
Program Name: Heating, Ventilation, and Air Conditioning/Refrigeration (HVAC/R)	Team Chair: Frank Vidas
Academic Dean: Mike Boyle	Divisional Dean: Randy Deli
Process Used to Complete the Self-Study	
Meeting format (in-person, IP, conference calls etc.)	In Person.
Number of meetings	One.
How was the self-study handled? (as a group, assigned to individuals to report back to group, etc.)	The participants reviewed the data independently before each meeting. When all data was analyzed in a section, the group met to discuss what was noted and worked to consensus on the findings.
Additional comments:	
Summary of Findings	
As you completed this self-study section of the program review, what areas "stand out" in your program? Please explain.	There has been a lot of new technology introduced into the program and the lab has expanded into an outdoor setting.
What has surprised you? Please explain.	Students do not complete random courses. At the completion of year two, there is no notable trend of specific courses leading to student non-completion.
List two or three of the items identified through your self-study that you will focus on to make improvements to your program.	Course outcome summaries will have content introduction, assessment, and reinforcement identified. All course outcome summaries will be updated. Critical thinking will be imbedded in more courses.
When/where in your program will you implement these improvements?	During the next two school years.
What methods (direct or indirect) will you use to assess the success of this implementation?	Direct.
What new outcomes or benchmarks do you hope to achieve through these recommended changes?	The courses will have clearly defined areas where content is introduced, assessed and reinforced.
Additional comments:	

SELF-STUDY CATEGORY RESULTS

Program and Category			
Program: Heating, Ventilation, and Air Conditioning/Refrigeration (HVAC/R) Category: Review of Most Recent Improvement Plan <i>(fill out a Self-Study Category Sheet for each section of the self-study. (Additional sections may be added if desired))</i>			
PLUSES (Strengths)		DELTAS (Opportunities)	
-The program moved from an associate's degree to a technical degree. -The program has a new instructor and is undergoing significant redesign. -The majority of items discussed in the most recent improvement plan are accomplished through earlier program modification.		-The program is no longer in the configuration that the last review process began under, so few previous items referenced currently apply.	
Select one PLUS item and explain the root cause:	The program has had most of its challenges removed due to a move from an associate program to a technical program.		
Select one DELTA item and explain the root cause:	Old review items do not necessarily fit with the new program design to give a good statistical comparison.		
What items in this category MUST be addressed on our improvement plan?	None.		
What items in this category MIGHT be addressed on the improvement plan?	None.		
What items in this category may be considered a BEST PRACTICE OR INNOVATION?	Having HVAC/R configured as a technical diploma program.		
Team Rating			
Please indicate by an (X) the team rating of your program on this category.			
<i>All areas need improvement</i>	<i>Some areas meet expectations, but most areas need improvement</i>	<i>All areas meet expectations —few areas need improvement</i>	<i>Exemplary—all areas exceed expectations—use as a model for other programs</i>
			X
Additional Comments: (optional)			

SELF-STUDY CATEGORY RESULTS

Program and Category			
Program: Heating, Ventilation, and Air Conditioning/Refrigeration (HVAC/R) Category: WITC Program Statistics <i>(fill out a Self-Study Category Sheet for each section of the self-study. (Additional sections may be added if desired))</i>			
PLUSES (Strengths)		DELTAS (Opportunities)	
-Program graduates have acquired program related employment (82%). -Most graduates are very satisfied or satisfied with their training.		-Increase program completion rates.	
Select one PLUS item and explain the root cause:	Extensive effort is put into meeting each individual student's learning needs. A cooperative team works together to address student challenges.		
Select one DELTA item and explain the root cause:	Analysis shows that individual students do not complete similar courses over the program's transformation from Associate Degree to Technical Diploma. There is no emergent trend notable in the two year data.		
What items in this category MUST be addressed on our improvement plan?			
What items in this category MIGHT be addressed on the improvement plan?	None at this point.		
What items in this category may be considered a BEST PRACTICE OR INNOVATION?	Student satisfaction.		
Team Rating			
Please indicate by an (X) the team rating of your program on this category.			
<i>All areas need improvement</i>	<i>Some areas meet expectations, but most areas need improvement</i>	<i>All areas meet expectations—few areas need improvement</i>	<i><u>Exemplary</u>—all areas exceed expectations—use as a model for other programs</i>
		X	
Additional Comments: (optional)			

SELF-STUDY CATEGORY RESULTS

Program and Category	
Program: Heating, Ventilation, and Air Conditioning/Refrigeration (HVAC/R) Category: Curriculum <i>(fill out a Self-Study Category Sheet for each section of the self-study. (Additional sections may be added if desired))</i>	
PLUSES (Strengths)	DELTAS (Opportunities)
<ul style="list-style-type: none"> -Students wear a GoPro Camera while working on labs. They talk about what and why they are doing things as they work through the lab. The film is then used as a self-assessment, group assessment, and instructor assessment. -Curriculum check sheets are up to date and accurately reflect industry needs. -WIDs documents are updated. -The program's curriculum has been upgraded. 	<ul style="list-style-type: none"> -Some course outcome summaries still need to be identified as to where they are introduced, assessed, and reinforced. -Still need to determine which course outcome summaries need to be updated.
Select one PLUS item and explain the root cause:	New technology (GoPro) has been embraced to enable students to present their learning without the pressure of the instructor present. The technology helps students to think through and articulate what and why they are doing things.
Select one DELTA item and explain the root cause:	Some course outcome summaries introduction, assessment and reinforcement need to be identified on a matrix as to where they occur. The instructor and rebuilt curriculum is relatively new and this will occur as the program matures.
What items in this category MUST be addressed on our improvement plan?	All course outcome summaries must be updated.
What items in this category MIGHT be addressed on the improvement plan?	Some course outcome summaries introduction, assessment and reinforcement need to be identified on a matrix as to where they occur. This will occur when TSA is implemented.
What items in this category may be considered a BEST PRACTICE OR INNOVATION?	Students wear a GoPro Camera while working on labs. They talk about what and why they are doing things as they work through the lab. The film is then used as a self-assessment, group assessment, and instructor assessment.

Team Rating

Please indicate by an **(X)** the team rating of your program on this category.

<i>All areas need improvement</i>	<i>Some areas meet expectations, but most areas need improvement</i>	<i>All areas meet expectations—few areas need improvement</i>	<i><u>Exemplary</u>—all areas exceed expectations—use as a model for other programs</i>
		X	
Additional Comments: (optional)			

SELF-STUDY CATEGORY RESULTS

Program and Category	
Program: Heating, Ventilation, and Air Conditioning/Refrigeration (HVAC/R) Category: Assessment of student learning <i>(fill out a Self-Study Category Sheet for each section of the self-study. (Additional sections may be added if desired))</i>	
PLUSES (Strengths)	DELTAS (Opportunities)
<p>-New technologies are being incorporated into the assessment of students. Items such as GoPro cameras are used to video student lab activities.</p> <p>-College wide outcomes, math, and critical thinking are imbedded in a number of core program courses.</p> <p>-Outcomes were reviewed and updated with the organization’s curriculum specialist.</p> <p>-The advisory board and students are informed of assessment results and the resultant potential changes or adjustments.</p>	<p>-Need to develop better course rubric matrices to refine and tighten course outcomes.</p> <p>-More core courses need to have critical thinking imbedded in the curriculum.</p>
Select one PLUS item and explain the root cause:	Course outcomes have been reviewed and updated. The items were updated because the program is in redevelopment and all items needed to be reviewed by the new instructor.
Select one DELTA item and explain the root cause:	There are so many items imbedded in each course outcome that it appears the range is too broad for effective instruction.
What items in this category MUST be addressed on our improvement plan?	Refine and reduce the course outcomes listed in each defined area of learning.
What items in this category MIGHT be addressed on the improvement plan?	None.
What items in this category may be considered a BEST PRACTICE OR INNOVATION ?	The involvement of students and advisory board members in assessment results and their input in regards to potential changes to the program.

Team Rating

Please indicate by an **(X)** the team rating of your program on this category.

<i>All areas need improvement</i>	<i>Some areas meet expectations, but most areas need improvement</i>	<i>All areas meet expectations—few areas need improvement</i>	<i><u>Exemplary</u>—all areas exceed expectations—use as a model for other programs</i>
		X	
Additional Comments: (optional)			

SELF-STUDY CATEGORY RESULTS

Program and Category			
Program: Heating, Ventilation, and Air Conditioning/Refrigeration (HVAC/R) Category: Advisory Committees <i>(fill out a Self-Study Category Sheet for each section of the self-study. (Additional sections may be added if desired))</i>			
PLUSES (Strengths)		DELTAS (Opportunities)	
-The committee's composition has been changing to better reflect industry. There are now five employers represented.		-The program needs to recruit a student services representative. -The program needs to recruit a general studies representative.	
Select one PLUS item and explain the root cause:	The program has been redesigning itself to better reflect current industry trends. To better meet the needs of industry, retiring members are being replaced with employers who specifically work in the install/service branch of the HVAC/R industry.		
Select one DELTA item and explain the root cause:	Many student service and general studies staff are on numerous other program Advisory Committees. The program also has a new instructor and he has been focused on getting a defined curriculum in place.		
What items in this category MUST be addressed on our improvement plan?	A student service and general studies staff representative must be recruited for involvement in the Advisory Committee meetings.		
What items in this category MIGHT be addressed on the improvement plan?	None.		
What items in this category may be considered a BEST PRACTICE OR INNOVATION?	The expansion of Advisory Committee membership to include employers who are on the cutting edge of the local industry.		
Team Rating			
Please indicate by an (X) the team rating of your program on this category.			
<i>All areas need improvement</i>	<i>Some areas meet expectations, but most areas need improvement</i>	<i>All areas meet expectations—few areas need improvement</i>	<i>Exemplary—all areas exceed expectations—use as a model for other programs</i>
		X	
Additional Comments: (optional)			

SELF-STUDY CATEGORY RESULTS

Program and Category			
Program: Heating, Ventilation, and Air Conditioning/Refrigeration (HVAC/R) Category: Equipment and Facilities <i>(fill out a Self-Study Category Sheet for each section of the self-study. (Additional sections may be added if desired))</i>			
PLUSES (Strengths)		DELTAS (Opportunities)	
-The lab has been significantly updated over the last two years. -All of the equipment is current. -Industry software is used.		-Limited computer hardware is located in the classroom. -There is no emergency remotely controlled main gas line shut off valve in the lab. -There are no refrigerant storage containers in the lab.	
Select one PLUS item and explain the root cause:	The lab has been in the process of a major rebuild over the last three years, including the addition of an outside fenced in work area.		
Select one DELTA item and explain the root cause:	There is no main gas line remote controlled emergency shut off valve due to our learning of a new industry standard.		
What items in this category MUST be addressed on our improvement plan?	A remote controlled main gas line shut off valve must be installed.		
What items in this category MIGHT be addressed on the improvement plan?	Storage containers suitable for refrigerant materials.		
What items in this category may be considered a BEST PRACTICE OR INNOVATION?	Installing computer stations in the classroom to enable new training software to be used.		
Team Rating			
Please indicate by an (X) the team rating of your program on this category.			
<i>All areas need improvement</i>	<i>Some areas meet expectations, but most areas need improvement</i>	<i>All areas meet expectations—few areas need improvement</i>	<i><u>Exemplary</u>—all areas exceed expectations—use as a model for other programs</i>
		X	
Additional Comments: (optional)			

SELF-STUDY CATEGORY RESULTS

Program and Category			
Program: Heating, Ventilation, and Air Conditioning/Refrigeration (HVAC/R)			
Category: Staff Development and Program Innovation			
<i>Fill out a Self-Study Category Sheet for each section of the self-study. (Additional sections may be added if desired)</i>			
PLUSES (Strengths)		DELTAS (Opportunities)	
-Affiliated with the Air Conditioning Contractors of America and Refrigeration Services Engineers Society. -There are some computers currently located in the classroom setting. -The instructor attends certification courses.		-Expand industry partnerships with outside organizations such as Snap-On Tool and Traine.	
Select one PLUS item and explain the root cause:	The affiliation enables students to have access to industry employers. It also enables them to learn new industry trends.		
Select one DELTA item and explain the root cause:	We currently have limited external partnerships beyond the advisory board. New partnerships will enable WITC to leverage industry donations.		
What items in this category MUST be addressed on our improvement plan?			
What items in this category MIGHT be addressed on the improvement plan?	Industry partnerships to be developed to leverage our instructional effectiveness.		
What items in this category may be considered a BEST PRACTICE OR INNOVATION?	Computers in the classroom to reinforce student learning and industry partnerships.		
Team Rating			
Please indicate by an (X) the team rating of your program on this category.			
<i>All areas need improvement</i>	<i>Some areas meet expectations, but most areas need improvement</i>	<i>All areas meet expectations—few areas need improvement</i>	<i><u>Exemplary</u>—all areas exceed expectations—use as a model for other programs</i>
		X	
Additional Comments: (optional)			

SELF-STUDY CATEGORY RESULTS

Program and Category			
Program: Heating, Ventilation, and Air Conditioning/Refrigeration (HVAC/R) Category: Collaboration Across the College <i>(fill out a Self-Study Category Sheet for each section of the self-study. (Additional sections may be added if desired))</i>			
PLUSES (Strengths)		DELTAS (Opportunities)	
-The instructor conducts four academic advising sessions with his students. -The core program instructor maintains close collaborations between himself and the general education instructors. -Active in program promotions.		-The program is lacking peer interactions with a program instructor (in the same discipline) from another campus.	
Select one PLUS item and explain the root cause:	Close collaboration: the staff are really engage in striving for student success.		
Select one DELTA item and explain the root cause:	There is no HVAC staff to work with or compare ideas with because WITC only offers HVAC at one location.		
What items in this category MUST be addressed on our improvement plan?	None.		
What items in this category MIGHT be addressed on the improvement plan?	None.		
What items in this category may be considered a BEST PRACTICE OR INNOVATION?			
Team Rating			
Please indicate by an (X) the team rating of your program on this category.			
<i>All areas need improvement</i>	<i>Some areas meet expectations, but most areas need improvement</i>	<i>All areas meet expectations—few areas need improvement</i>	<i><u>Exemplary</u>—all areas exceed expectations—use as a model for other programs</i>
		X	
Additional Comments: (optional)			

Perkins Data Review

PERKINS DATA REVIEW

(replaces QRP Analysis for 2013 reviews only)

Program and Category	
Program: Heating, Ventilation, and Air Conditioning/Refrigeration (HVAC/R) Category: Perkins Data Review	
PLUSSES (Strengths)	DELTAS (Opportunities)
<p>-1P1 91.18 Three year average for technical course completion exceeds benchmark of 82.22.</p> <p>-1P2 General Studies course completion has shown an upward trend over the last three years.</p> <p>-2P1 Program degree attainment of 68.57 over the last three years exceeds benchmark of 55.00.</p> <p>-2P1 + 3P1 Combination of degree attainment & retention percentage of 71.43 exceeds benchmark of 66.78.</p>	<p>-1P1 Technical course completion below benchmark for 2011 at 77.78.</p> <p>-1P2 General Studies course completion does not meet the benchmark of 83.71.</p> <p>-4P1 The three year average of 87.10 is below the benchmark of 90.41. The trend is moving upward.</p>
<p>Select one PLUS item and explain the root cause:</p>	<p>2P1– Program degree attainment percentage exceeds the benchmark. The demand for graduates continues to rise.</p>
<p>Select one DELTA item and explain the root cause:</p>	<p>1P2 – General Studies course completion percentage. The program change from associate degree to technical diploma was completed in 2010. The General Studies course completion percentage has steadily increased since that change.</p>
<p>What items in this category MUST be addressed on our improvement plan?</p>	
<p>What items in this category MIGHT be addressed on the improvement plan?</p>	<p>1P2 - General Studies course completion percentage has steadily increased. This trend needs to be reevaluated a year from now.</p>
<p>What items in this category may be considered a BEST PRACTICE OR INNOVATION?</p>	

FUTURE TRENDS AND EXTERNAL FACTORS

Program	Heating, Ventilation, and Air Conditioning/Refrigeration (HVAC/R)
Future Trends	
•	Continued growth in industry as construction starts increasing.
•	Energy Efficiencies.
•	“Off the grid” Alternative Energy.
•	The need for HVAC/R Technicians will increase.
•	
•	
External Factors	
•	Shortage of skilled HVAC technicians.
•	Environmental regulations.
•	
•	
•	
Employment Trends	
Local	The demand for HVAC/R Technicians increases as the construction industry activity increases.
•	
State	Across the state we will see many existing HVAC technicians retiring and need for replacements.
•	

2013 Improvement Plan

ACADEMIC PROGRAM IMPROVEMENT PLAN

PROGRAM:	Heating, Ventilation, and Air Conditioning/Refrigeration (HVAC/R)			
Defined Outcome: Current and Updated Program Course Curriculum	Perkins? No	Responsibility	Timeline	Resources
Action Plan/Action Items: -Complete updating of program curriculum -Explore adding Blackboard presence to courses -Update WIDS analyzer		Instructor/Dean Web Manager	Spring 2014-Fall 2015	Curriculum Office Web Manager
Perkins Data:				

Update: *(A mid-year and year-end update will be required each year during implementation.)*

June 2014

Program upgrades: Low pressure boiler curriculum added. DDC Innotech control curriculum added.

Due to other program upgrades and instructor time constraints Blackboard will not be addressed at this time.

WIDS analyzer will be updated once all of the curriculum updating has been completed.

January 2015

Program upgrades: Working on NC3 program upgrades. There will be 5 program upgrades added to the current curriculum. No major modifications will be made to the curriculum. NC3 upgrades will be added to 4 existing courses.

Blackboard presence: Research has been done to implement this, but stopped the implementation because of the NC3 initiative. Blackboard presence will be re-evaluated after the NC3 curriculum upgrades have been added.

WIDS Analyzer: WIDS analyzer will be updated once all of the NC3 curriculum updating has been completed.

June 2015

Update WIDS analyzer as part of phase II TSA. Program curriculum has been updated and meets all requirements for NC3 initiative. We are a member of NC3 and Frank has implemented NC3 curriculum into his current curriculum. Frank is teaching NC3 curriculum currently.

January 2016

WIDS analyzer is updated and current curriculum will be reflective of all NC3 curriculum that needs to be included to follow the NC3 model. Many updates have already been implemented to meet NC3 standards.

ACADEMIC PROGRAM IMPROVEMENT PLAN

PROGRAM: Heating, Ventilation, and Air Conditioning/Refrigeration (HVAC/R)				
Defined Outcome: Improve General Studies Course Completion to Benchmark	Perkins? Yes	Responsibility	Timeline	Resources
Action Plan/Action Items: -Evaluate progress towards increasing General Studies course completion and percentage on an annual basis. -Meet with General Studies instructors periodically to monitor student progress.		Program instructor/Dean/ Office of Institutional Effectiveness General Studies Instructors and Program Instructor	Spring 2014-Fall 2015	Perkins Data
Perkins Data: IP2				
<p>June 2014 Instructor worked this year on monitoring students' progress with their General Studies courses and stayed in direct contact with the General Studies instructors. Progress evaluation related to increasing course completion and percentage will be analyzed after the first full year has been completed. C200</p> <p>January 2015 Instructors still monitoring. Course completion and percentage will be analyzed after the next 6 months.</p> <p>June 2015 Conversations have been made with the general studies instructors and will be invited to future advisory committee meetings and will be part of the agenda to explain their purpose in the program.</p> <p>January 2016 One of Frank's goals for the 2015-16 school year was to meet with general studies instructors to ensure gen studies have been aligned to meet the NC3 model.</p>				

ACADEMIC PROGRAM IMPROVEMENT PLAN

PROGRAM:	Heating, Ventilation, and Air Conditioning/Refrigeration (HVAC/R)			
Defined Outcome: To ensure a safe student learning environment	Perkins? No	Responsibility	Timeline	Resources
Action Plan/Action Items: -Installation of a remote controlled main gas line shut off valve in the lab. -Obtain storage containers for refrigerant materials.		Instructor/Dean	Spring 2014-Fall 2015	Planning Process
Perkins Data:				
<p>Update: (A mid-year and year-end update will be required each year during implementation.)</p> <p>June 2014 The action items will be included in full 2014 planning documents.</p> <p>January 2015 Based on the program changes, upgrade modifications will be put on hold until NC3 certification is implemented and modifications will be included at the time of NC3 implementation.</p> <p>June 2015 NC3 initiatives are being implemented summer 2016 to address all safety issues in the remodel of the lab.</p> <p>January 2016 Current bids are being accepted for a remodel of the HVAC/R lab. All current issues have been addressed and implemented into the remodel plan to be completed by August 2016.</p>				

ACADEMIC PROGRAM IMPROVEMENT PLAN

PROGRAM:	Heating, Ventilation, and Air Conditioning/Refrigeration (HVAC/R)			
Defined Outcome: Improved Advisory Committee Meetings	Perkins? No	Responsibility	Timeline	Resources
Action Plan/Action Items: <i>Invite General Studies and Student Services Personnel to ensure their attendance.</i>		Instructor/Dean	Spring 2014-Fall 2015	Advisory Committee
Perkins Data:				
<p>Update: (A mid-year and year-end update will be required each year during implementation.)</p> <p>June 2014 This will be addressed Fall 2014.</p> <p>January 2015 General Studies and Student Services representation was invited to the last Advisory Committee meeting.</p> <p>June 2015 General studies and student services representatives were not present at last advisory committee meeting, follow-up will be done.</p> <p>January 2016 It is noted that on every advisory committee meeting, student services and general studies staff are invited. Depending on availability of staff is whether or not the staff are able to be present at each meeting.</p>				

ACADEMIC PROGRAM IMPROVEMENT PLAN

PROGRAM:	Heating, Ventilation, and Air Conditioning/Refrigeration (HVAC/R)			
Defined Outcome: Refine or Reduce the Number of Course Outcomes	Perkins? No	Responsibility	Timeline	Resources
Action Plan/Action Items: -Refine the course outcomes. -Embed additional critical thinking into program curriculum.		Instructor Curriculum Designer	Spring 2014-Fall 2015	Curriculum Office
Perkins Data:				
<p>Update: (A mid-year and year-end update will be required each year during implementation.)</p> <p>June 2014 We added course curriculum to Electronic Energy Management (32601308). DDC counted based on projects involving critical thinking.</p> <p>January 2015 Andrea Schullo and Frank have tightened up the course outcomes and added Innotech DDC control curriculum which involves more critical thinking.</p> <p>June 2015 TSA state meeting identified new course outcomes for HVAC curriculum.</p> <p>January 2016 TSA implementation required HVAC curriculum to align under less course outcomes.</p>				

ACADEMIC PROGRAM IMPROVEMENT PLAN

PROGRAM:	Heating, Ventilation, and Air Conditioning/Refrigeration (HVAC/R)			
Defined Outcome: TSA Implementation	Perkins? No	Responsibility	Timeline	Resources
Action Plan/Action Items: -Phase I TSA is completed. -Phase II TSA is completed. -TSA Assessments are completed for each program student.		Instructor/Dean	Spring 2014 – Fall 2015	Cindy King
Perkins Data:				
<p>Update: (A mid-year and year-end update will be required each year during implementation.)</p> <p>June 2014 TSA Phase 1 implementation to begin during the 2014-2015 school year.</p> <p>January 2015 TSA Phase 1 implementation has not been identified or communicated to the HVAC faculty to ensure implementation. Instructors will be meeting state wide in February to establish and brainstorm the phase one parameters for assessment with the HVAC Program.</p> <p>June 2015 TSA phase II is completed and data collection is due to begin fall 2015.</p> <p>January 2016 TSA data collection is currently being implemented. Submission of the data will go to Shell Lake for review.</p>				