



HVAC and Plumbing Technology

Expansion of Existing Program

State Submission

Mark Wilson, President

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WESTERN DAKOTA TECHNICAL INSTITUTE (WDT)

HVAC and Plumbing Technology AAS Program

Expansion of Existing Programs

EXECUTIVE SUMMARY

Western Dakota Technical Institute requests approval to create an Associate of Applied Science degree in HVAC and Plumbing Technology. This new option would be created by combining already existing diploma programs in HVAC Technology and Plumbing Technology and adding additional general education courses. WDT would continue to offer diplomas in HVAC Technology and Plumbing Technology so students have multiple options and exit points.

WDT requests permission to begin offering the program option in Fall 2013.

Labor market information for the state indicates that the demand for workers in the HVAC and Plumbing fields is strong now and in the future.

- Through 2020, the number of heating, air conditioning, and refrigeration technicians is expected to grow by 23.3 percent, according to the South Dakota Labor Market Information Center (LMIC).
- Through 2020, the number of plumbers, pipefitters, and steamfitters is expected to grow by 10 percent, according to the South Dakota Labor Market Information Center (LMIC).

Graduates of this program will be able to seek employment in a variety of settings, including HVAC companies, plumbing companies, and public entities. The program will fulfill industry need because companies that complete HVAC and plumbing projects are seeking employees who are skilled in both areas. This program will meet that need.

The program will serve as an umbrella program for WDT's diploma programs in HVAC Technology and Plumbing Technology. Students will be required to complete one of the diploma programs before moving on to complete the AAS degree program.

Western Dakota Tech is an excellent fit for this new program option as we already have created curriculum for the HVAC Technology and Plumbing Technology program. Adding a new option will build on those programs while not adding an extensive amount of new expenditures.

IDENTIFICATION AND DESCRIPTION OF THE PROGRAM

Many private companies complete HVAC and plumbing projects for residential and commercial customers. This program will graduate skilled technicians who are able to bring value to employers in multiple ways. These workers will be flexible and will be seen as a valuable part of any of these employers.

In the HVAC field, graduates will be able to design residential and light commercial central heating and air conditioning systems according to load requirements. Graduates will be able to install, troubleshoot and repair residential and light commercial heating and air conditioning equipment; design, fabricate and install forced air and hot water distribution systems using sheet metal, duct board, copper tubing, Wirsbo tubing, Pex tubing, PVC and other accepted materials; install a wide range of oil and gas boilers and forced-air furnaces; and design, fabricate and install home and light commercial ventilation systems, including both exhaust and fresh air make-up exchangers. Students also will prepare for and take the universal HVAC certification exam so they are qualified to handle all types of refrigerant upon graduation.

In the Plumbing field, the program will provide students with technical understanding and skills development and integrates theory with practical experience. Through the program, the student develops skills in piping techniques and procedures, plumbing and piping systems, residential and commercial system installations, blueprint reading and isometric interpretation. The successful graduate is eligible for 800 hours on his or her apprenticeship card and employment at an advanced apprenticeship level in a variety of businesses found in rural and metropolitan areas.

OBJECTIVES AND PURPOSE OF THE PROGRAM

The primary objective of the HVAC and Plumbing Technology program is to prepare students with the necessary skills to be successful in the HVAC and plumbing fields. The AAS expansion will provide students with the opportunity to become skilled technicians in two areas that are becoming more and more related as businesses expand so they can complete work in both areas. Employees with skills in both areas will be more employable because they will be more flexible. Students in the AAS program will take coursework in HVAC theory, HVAC installation, plan and print reading, plumbing theory, plumbing practices, and other technical skills. This program also will provide education and training in soft skills such as communication and math. The AAS will require students to take additional, higher-level general education courses that will provide them with the skills employers desire.

The program will articulate appropriate high school credits whenever possible, and there could be dual enrollment possibilities for high school students.

After successful completion of all program requirements, the HVAC and Plumbing Technology graduate will be able to:

- Exhibit safety practices and procedures
- Perform HVAC system design, installation, maintenance, and troubleshooting
- Demonstrate professionalism and related soft skills
- Layout and wire electrical schematics
- Pass the Universal HVAC certification exam
- Classify the use of common plumbing materials
- Analyze blueprints and isometric drawings
- Demonstrate proper techniques and procedures for installation of plumbing systems
- Apply knowledge of model plumbing code rules and regulations

METHODS OF ATTAINING THE OBJECTIVES OF THE PROGRAM

WDT will provide students with skill-based development in classroom and lab settings on the WDT campus. The classroom and lab instruction will be augmented with guest speakers and other experiences that will prepare students for the workforce.

As with all WDT programs, a variety of services and support are available to students in the HVAC and Plumbing Technology program. This includes expanded tutoring and office hours provided by full-time program faculty and at WDT's Academic Success Center. Access to current technical reference materials and resources is available via WDT library services.

The HVAC and Plumbing Technology program will work closely with an industry advisory board composed of representatives who are from HVAC and plumbing businesses, public entities, and others in the field. The Advisory Board will approve the curriculum, discuss and recommend equipment purchases, and assist in forming partnerships to help WDT with innovative curriculum, internships, and presentations.

As indicated in the letters of support that accompany this proposal, industry is supportive of this program expansion. Future employers of program graduates have stated this program is necessary because they want employees who have skills in multiple technical areas. This program will meet that need. Graduates with skills to serve industry as an HVAC and plumbing technician will be more flexible and more valuable to their employers. In addition, adding general education courses will provide students with the additional math, English, and communication skills employers are seeking.

POPULATION SERVED BY THE PROGRAM

The HVAC and Plumbing Technology program will be available to all interested individuals who successfully meet the WDT admissions criteria established for the program. The program will be open to full-time and part-time students. All applicants must be high school graduates and take an admissions test to establish reading, writing, and math abilities. No restriction will be made regarding race, creed, gender or age. The program will draw students primarily from South Dakota. The opportunities for employment in the field will be primarily in western South Dakota.

The program also will appeal to people already in the workforce who have a diploma in one of these fields and are seeking additional training so they can increase their skills level and become prepared for additional job opportunities in these growing career fields.

PROJECTED THREE-YEAR BUDGET

This program will share a full-time program coordinator. Adjunct instructors with industry experience would serve as instructor for courses not taught by program coordinator. The projected budget is as follows:

Expenses	Year One	Year Two	Year Three
Instructors	\$66,152.00	\$68,136.00	\$70,180.00
Equipment	\$25,000.00	\$25,000.00	\$10,000.00
Supplies	\$10,000.00	\$10,000.00	\$10,000.00

PROGRAM COMPETENCIES AND ENTRY AND EXIT POINTS

Entry point: Fall Semester

Exit point: After completion of all coursework

Job titles: See Appendix A

STATEMENT OF NON-DUPLICATION

Western Dakota Tech is proposing this program to meet regional industry needs for HVAC and plumbing technicians. While there are other HVAC-related programs in South Dakota, they are not meeting the needs of industries in western South Dakota. There are no programs that combine these two fields, and industry representatives are seeking trained employees who have skills in both of these technical areas.

CURRICULUM DESIGN

See Appendix B for Curriculum Sequence.

WAGE FACTOR

See Appendix A

SUGGESTED CIP CODE

WDT will use the CIP Code for Heating, Air Conditioning, Ventilation, and Refrigeration Maintenance Technology/Technician for this program because WDT expects more graduates to enter that field after graduation from the program.

47.0201 Heating, Air Conditioning, Ventilation and Refrigeration Maintenance Technology/Technician. A program that prepares individuals, under the supervision of pharmacists, to prepare medications, provide medications and related assistance to patients, and manage pharmacy clinical and business operations. Includes instruction in medical and pharmaceutical terminology; principles of pharmacology and pharmaceuticals; drug identification; pharmacy laboratory procedures; prescription interpretation; patient communication and education; safety procedures; record-keeping; measurement and testing techniques; pharmacy business operations; prescription preparation; logistics and dispensing operations; and applicable standards and regulations.

APPENDIX

- A. Wage factor and job titles
- B. Curriculum Outline
- C. Letters of Support

APPENDIX A

South Dakota Employment Projections 2010-2020 and Wage Data for Related Occupations

SOC	Occupational Title	2010 Base Number of Jobs	2020 Projected Number of Jobs	Percent Change	Average Annual Demand
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	1,010	1,245	23.3	40
47-2152	Plumbers, Pipefitters, and Steamfitters	1,195	1,315	10.0	36

South Dakota Wage Estimates for SD, Rapid City, and West					Percentile				
AREA	SOC CODE	Occupation	Workers	Avg. Wage	10 th	25 th	50 th	75 th	90 th
Statewide	49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	710	20.11	13.25	15.49	18.82	23.20	28.61
Rapid City MSA	49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	110	19.02	14.50	16.30	18.38	21.83	25.72
West	49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	N/A	16.68	12.71	13.94	15.96	17.96	24.54
Statewide	47-2152	Plumbers, Pipefitters, and Steamfitters	1040	18.66	12.76	14.42	17.86	21.93	26.61
Rapid City MSA	47-2152	Plumbers, Pipefitters, and Steamfitters	210	20.28	13.33	16.31	20.08	23.59	28.28
West	47-2152	Plumbers, Pipefitters, and Steamfitters	100	15.88	12.33	13.27	15.05	18.13	21.23

United States Employment Projections 2010-2020 and Wage Data for Related Occupations

SOC	Occupational Title	2010 Base Number of Jobs	2020 Projected Number of Jobs	Percent Change	Average Annual Demand
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	267,800	358,100	33.7	13,760
47-2152	Plumbers, Pipefitters, and Steamfitters	419,900	527,500	25.6	22,880

Wage Estimates for United States				Percentile				
SOC	Occupational Title	2012 Workers	Avg. Wage	10th	25th	50th	75th	90th
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	240,480	20.98	13.14	16.40	20.98	27.07	33.17
47-2152	Plumbers, Pipefitters, and Steamfitters	340,370	23.62	13.95	17.72	23.62	31.75	40.60

APPENDIX B

First Semester		Credits
MATH104	Technical Math	3
HVAC120	Electrical Applications for HVAC	3
HVAC125	HVAC Installation I	7
HVAC130	HVAC Plan and Print Reading	2
CIS105	Microcomputer Software Applications	3
	TOTAL CREDITS	18
Second Semester		Credits
PSYC103	Human Relations in the Workplace	3
ENGL201	Technical Writing	3
HVAC135	Electrical Applications for HVAC II	3
HVAC140	Pipe Joining Methods	3
HVAC145	HVAC Installation II	6
	TOTAL CREDITS	18
Third Semester		Credits
MATH100	Elementary Algebra	3
PLU120	Plumbing Theory I	6
PLU125	Plumbing Practices I	4
PLU130	Plumbing Plan and Print Reading	2
	TOTAL CREDITS	15
Second Semester		Credits
ECON202	Principles of Macroeconomics	3
PLU135	Plumbing Theory II	7
PLU140	Plumbing Practices II	4
PLU145	Advanced Plumbing Plan and Print Reading	2
	TOTAL CREDITS	16

APPENDIX C



SOUTH DAKOTA ASSOCIATION

OFFICE OF THE
EXECUTIVE VICE PRESIDENT
ken.phcc@midconetwork.com

OF PLUMBING • HEATING • COOLING CONTRACTORS, INC.

(605) 271-7255 • 1-800-640-7422 • 1000 N. WEST AVE. #200 • SIOUX FALLS, SD 57104

February 4, 2013

Mr. Mark Wilson, President
Western Dakota Tech
800 Mickelson Drive
Rapid City, SD 57703

Dear Mr. Wilson,

The South Dakota Association of Plumbing, Heating, Cooling Contractors is interested in a possible HVAC and Plumbing Technology Associate Degree Program to be offered by Western Dakota Tech.

The South Dakota PHCC represents about 70 contractor members in South Dakota and Sioux City, Iowa. Our members range in size from 150 employees to two or three employees.

Our members constantly seek qualified applicants and cannot find sufficient candidates to meet the demand. Some of our members have to actively recruit employees from out-of-state technical schools. Contractors in the Black Hills region would certainly welcome an appropriate training program in western South Dakota. Our industry is also facing a chronic, growing shortage of qualified professionals who have obtained appropriate training.

We offer this letter of support, and we offer an extensive apprenticeship program for students who want to advance their career once they've completed a formal HVAC and Plumbing Associate Degree Program curriculum. We would further help with guest speakers and supplemental information for the program and its students.

Thank you for your efforts to advance the p-h-c industry. We look forward to the development of this program.

Sincerely,

Ken Melius
Executive Vice President

Action Mechanical, Inc.

PLUMBING • HEATING • SHEET METAL • AIR CONDITIONING

1856 Lombardy Drive • P.O. Box 880
Rapid City, SD 57709-0880

Phone: (605) 348-5212
Fax: (605) 348-6984

February 4, 2013

Mr. Mark Wilson, President
Western Dakota Tech
800 Mickelson Drive
Rapid City, SD 57703

Dear Mr. Wilson,

Action Mechanical, Inc. of Rapid City is interested in a possible HVAC and Plumbing Technology Associate Degree Program to be offered by Western Dakota Tech.

Action Mechanical is one of the largest employers of mechanical professionals in the Black Hills area. We are constantly seeking qualified employees in plumbing and HVAC specialties. Contractors in the Black Hills region would certainly welcome an appropriate training program in western South Dakota. Our industry is also facing a chronic, growing shortage of qualified professionals who have obtained appropriate training.

We offer this letter of support, and we offer an extensive apprenticeship program for students who want to advance their career once they've completed a formal HVAC and Plumbing Associate Degree Program curriculum. We would further help with guest speakers and supplemental information for the program and its students.

Thank you for your efforts to advance the p-h-c industry. We look forward to the development of this program.

Sincerely,



Missy Sheesley-Johnson
President



WOLFF'S PLUMBING & HEATING, INC.

614 South 32nd Street - PO Box 97 - Spearfish, SD 57783
Ph - (605) 642-5755 - Fax - (605) 642-5757

February 7, 2013

Mr. Mark Wilson, President
Western Dakota Tech
800 Mickelson Drive
Rapid City, SD 57703

Dear Mr. Wilson,

As a Black Hills area business and employer, we are interested in a possible HVAC and Plumbing Technology Associate Degree program offered by Western Dakota Tech.

As a mechanical contractor, we employ many plumbing and HVAC professionals who work on large commercial projects or who provide services to individual residential customers. The plumbing and HVAC industries are fast-changing industries with constant technical changes requiring educated and well-trained employees who can master these disciplines.

We are always seeking qualified employees, and employees who have received formal training and education are an asset to our business. The P-H-C industry faces a critical shortage of trained employees entering our industry—both locally and nationally. We support efforts to increase structured training in our geographic area, there are currently no local programs to formally train those students who want to become plumbing or HVAC professionals. These skills are in high demand. Job security, plus pay and benefits, are above average for these professionals.

I hope this plumbing and HVAC program can be developed and our company would support your efforts to inform policy makers and the public of the great career opportunities available to graduates of your program.

Thank you.

Sincerely,



Greg Hartman
President