

Program Review

Executive Summary

Heating, Ventilation & Air Conditioning Design Technology

Majors Reviewed:

- *Heating, Ventilation & Air Conditioning Design Technology, B.S.*
- *Heating, Ventilation & Air Conditioning Technology, A.A.S.*
- *Plumbing, Certificate*

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Heating, ventilation and air conditioning (HVAC) and/or plumbing instruction has existed at Williamsport Technical Institute (WTI), Williamsport Area Community College (WACC), and Penn College continuously since at least 1949. In 1996 a bachelor degree program was added to the existing plumbing certificate and associate degree programs. In 2007 a high enrollment of 181 students was reached. In general the program enrollment is growing and is expected to show a 4% growth over the next 5 years.

Employment in HVAC is considered a “High Priority Occupation” and is expected to grow at rates over 20% in the coming years. The HVAC Advisory Committee says the reasons for this growth include the need for educated technicians to install and service new, high efficiency and technologically advanced equipment. The current national emphasis on ‘green’ jobs is also encouraging employment in the HVAC industry.

The HVAC program provides useful resources for the college as well as the region. The program offers certification exams for the EPA as well as the National Oilheat Research Alliance (NORA). Faculty teach courses needed by the Building Automation Technology (BBT) and Building Science & Sustainable Design (BSD) majors as well as electrical courses needed by our own students. The faculty offer courses through Workforce Development and Continuing Education (WDCE) on an as-needed basis. Faculty have also been active in designing new majors in BSD, Renewable Energy Technologies (RE) and Industrial and Human Factors Design (IID). The lab facilities and equipment are used by instructors from Building Construction, Electrical, Architecture as well as Hospitality to enhance instruction involving mechanical building systems.

The department has a seasoned faculty consisting of seven full time and five adjunct instructors who as a group boast 299 years of industry experience and 139 years of college teaching experience. Faculty remain current by reading industry journals, participating in professional development and through memberships in national industry associations including American Society for Heating Refrigeration and Air Conditioning Engineers (ASHRAE), National Association of Oil Heating Service Managers (NAOHSM), and Air Conditioning Contractors of America (ACCA).

The excellent faculty, curriculum, lab facilities, and equipment qualify the Penn College HVAC program as PAHRA accredited (Partners in Air Conditioning, Heating and Refrigeration Accreditation) as well as a certified NORA training and testing center. The EPA Section 608 Refrigerant Management exam is also offered by the program.

Graduation rates at 59% for the bachelor’s program and 50% for the associate’s degree exceed the rates of the college as a whole. First-year retention rates, at 75% over the period 2004 through 2009 are over ten percentage points higher than the college average. Student learning is assessed by ICE exam results (Industry Competency Exam) which have been consistently higher than state averages, but in some areas below national averages. Student quality is demonstrated by participation in the ASHRAE club and the ACCA club, which claimed the top student organization award in 2008. HVAC students also regularly win national industry scholarships and competitions

including ASHRAE, NAOHSM and AHRI (Air-Conditioning, Heating, and Refrigeration Institute).

Student enrollment over the past five years has averaged 112 in the associate degree program, 52 in the bachelor program and 5 in the plumbing certificate program and has shown growth over the period. Students carry an average load of 16 to 17 credit hours and classes are filled to 85% of capacity on average over the past three years, and 90% in the most recent year.

Program revenues exceed costs, with costs at 14% of the school's burden, while accounting for 17% of the school's students and credit hours. Additionally the department receives equipment donations from local and national companies totaling \$78,128 since 2008. As part of the program, students complete valued HVAC and plumbing installations that benefit the college and local community, including those for the Newberry Lion's Club, Montoursville Little League, Habitat for Humanity, and Penn College lab facilities.

The program's successful preparation of students for employment in the HVAC, plumbing and refrigeration industries is essential to the mission of the school and the college. Since every building in which people work or live requires HVAC and plumbing and these buildings use 40% of energy consumed, educated and skilled HVAC technicians and designers are needed for the present and the future workforce.

The final section of this report examines the strengths, weaknesses, opportunities and threats concerning the department. Strengths include quality students, faculty and facilities, as well as strong enrollment in recent years. Weaknesses include the need to replace three retiring or relocating faculty in the next five years. This is also an opportunity to attract and hire quality faculty experienced in the newest technologies. A second weakness is lower than desired ICE exam scores, the goal being to score consistently above national averages in all categories. This is being addressed by a program analysis that is currently under way. Thirdly, additional lab space is required for current and future needs. Threats focus on competition from state community colleges which regularly offer HVAC programs as well as the growth of on-line degree programs.

The HVAC program at Penn College expects to succeed and grow by continuing to provide an excellent education that propels students into relevant, high paying jobs