

2006-1478: TWO-YEAR COLLEGE PARTNERS WITH FOUR-YEAR UNIVERSITY TO OFFER EVENING ENGINEERING DEGREES

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Two-Year College Partners with Four-Year University to Offer Evening Engineering Degrees

Abstract

The University of Wisconsin-Fox Valley is one of thirteen two-year campuses throughout Wisconsin that comprise the University of Wisconsin Colleges. The UW Colleges belong to the University of Wisconsin System, which also oversees the thirteen four-year public universities throughout the state. UW-Fox Valley is a region located in northeastern Wisconsin with a MSA population of over 300,000 and is a major manufacturing nexus of the state. This significant industrial base utilizes a large number of engineers in their operations. In 1998, local business leaders expressed a need for a baccalaureate level engineering program for non-traditional students who are place bound by circumstance or preference. This program would allow area employees to advance in their profession and provide employers with needed engineering professionals.

This paper discusses the response to industry demand for undergraduate engineering education in northeastern Wisconsin, and how UW-Fox Valley collaborated with the University of Wisconsin-Platteville to develop the Fox Valley Engineering Program. UW-Platteville is a four-year comprehensive university located in southwestern Wisconsin. The two schools had previously established a transfer articulation agreement in engineering, which made this new collaboration a natural partnership. The program utilizes the faculty, pre-engineering curriculum and physical campus of UW-Fox Valley, and the ABET accredited mechanical engineering curriculum, faculty, and equipment of UW-Platteville. Through funding donated by local businesses in the Fox Valley, and appropriation for equipment from the State of Wisconsin, facilities for a mechanical engineering program were constructed and equipped in time for the degree to become available in the fall semester of 2002.

The program currently has an enrollment of 77 pre-engineering students who plan to finish their mechanical engineering degree at UW-Fox Valley in the UW-Platteville engineering program. There are 41 students in the mechanical engineering program, which graduated its first five students in December of 2005. The students range in age from 18 to 50 years and typically hold part-time or full-time jobs while attending late afternoon or evening courses. Many of them are technicians who hold associate degrees in engineering related fields from state technical colleges. Due to the strong support of local industry, UW-Platteville has also launched a collaborative electrical engineering degree at the UW-Fox Valley campus that began offering courses in the spring semester of 2006. The presence of undergraduate engineering education in the Fox Valley is a great benefit to area industry, students, and citizens.

Background

The University of Wisconsin-Fox Valley campus is located in the greater Fox Valley region of northeastern Wisconsin. It is one of thirteen two-year campuses throughout Wisconsin that comprise the University of Wisconsin Colleges. The UW Colleges belong to the University of Wisconsin System, which also oversees the thirteen four-year public universities throughout the state. A map of the UW-System two-year and four-year institutions is shown in Figure 1. The UW Colleges enrolls over 12,400 students per year.² UW-Fox Valley is the second largest UW College with nearly 1700 students; approximately half of them are part-time. A panoramic view of the campus is shown in Figure 2.

Figure 1. The Four-Year and Two-Year Campuses in UW-System¹

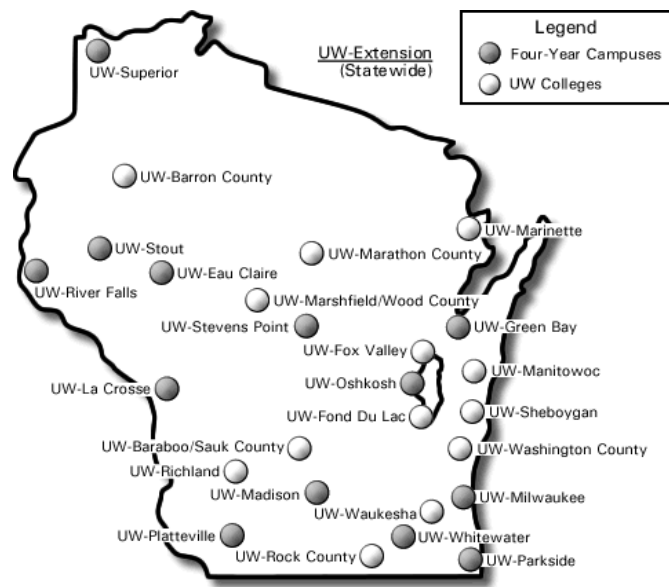


Figure 2. The UW-Fox Valley Campus



The UW Colleges has 17 academic departments; the Computer Science, Engineering, Physics and Astronomy (CSEPA) disciplines compose the CSEPA department, which has a full-time engineering faculty member at each of the UW-Fox Valley, UW-Baraboo/Sauk County, UW-Marathon County and UW-Waukesha campuses. The latter three broadcast distant education engineering courses to the 9 other UW College campuses while the courses taught at UW-Fox Valley are only offered to on-campus students. UW-Fox Valley also hires adjunct faculty to teach one to two courses per semester. The two-year pre-engineering program at UW-Fox Valley began in 1982 and has grown to offer the following courses: Introduction to Engineering, Engineering Graphics, Engineering Economics, Statics, Dynamics, and Mechanics of Materials. Thermodynamics will also be offered as a distance education class for the first time in the spring of 2008. Once engineering students had completed their first two years at UW-Fox Valley, they historically transferred to UW-Madison, UW-Milwaukee, UW-Platteville, Milwaukee School of Engineering, University of Minnesota or Michigan Tech since none of the state's engineering schools were located nearby.

The significant industrial base in the Fox Valley drove a need for an engineering program in the area. Fox Valley is one of the 50 largest manufacturing centers in the nation. Major manufacturing employers include Kimberly-Clark Corp., Georgia-Pacific Corp., Appleton, Oshkosh Truck Corp., Plexus Corp., Bemis, Banta Corp., Pierce Manufacturing, Inc., International Paper, Miller Electric Manufacturing Co., SCA Tissue North America, Menasha, Corp., Proctor and Gamble Paper Products, Presto Products Co., Paper Converting Machine Company and Neenah Foundry.^{3,4,5,10}

Area companies requested an engineering program that would be tailored to non-traditional students who are place bound by circumstance or preference. A local program would allow area employees to advance in their profession and provide employers with needed engineering professionals.

Prior to 1998, companies in the area were utilizing the engineering technology program that a private engineering school was offering at the Fox Valley Technical College. While this program was not an engineering degree, it was all that was offered in the area. In the fall of 1998, this school announced that they needed their own local campus to continue offering their program and consulted with the Fox Cities Chamber of Commerce to determine if local industry would make contributions of approximately \$8 million to construct a new facility. During a Chamber-led discussion about this request, the Campus Executive Officer /Campus Dean of UW-Fox Valley suggested that a collaborative program with an existing engineering school within the UW System, such as UW-Platteville, could accomplish the goals much more economically.⁶

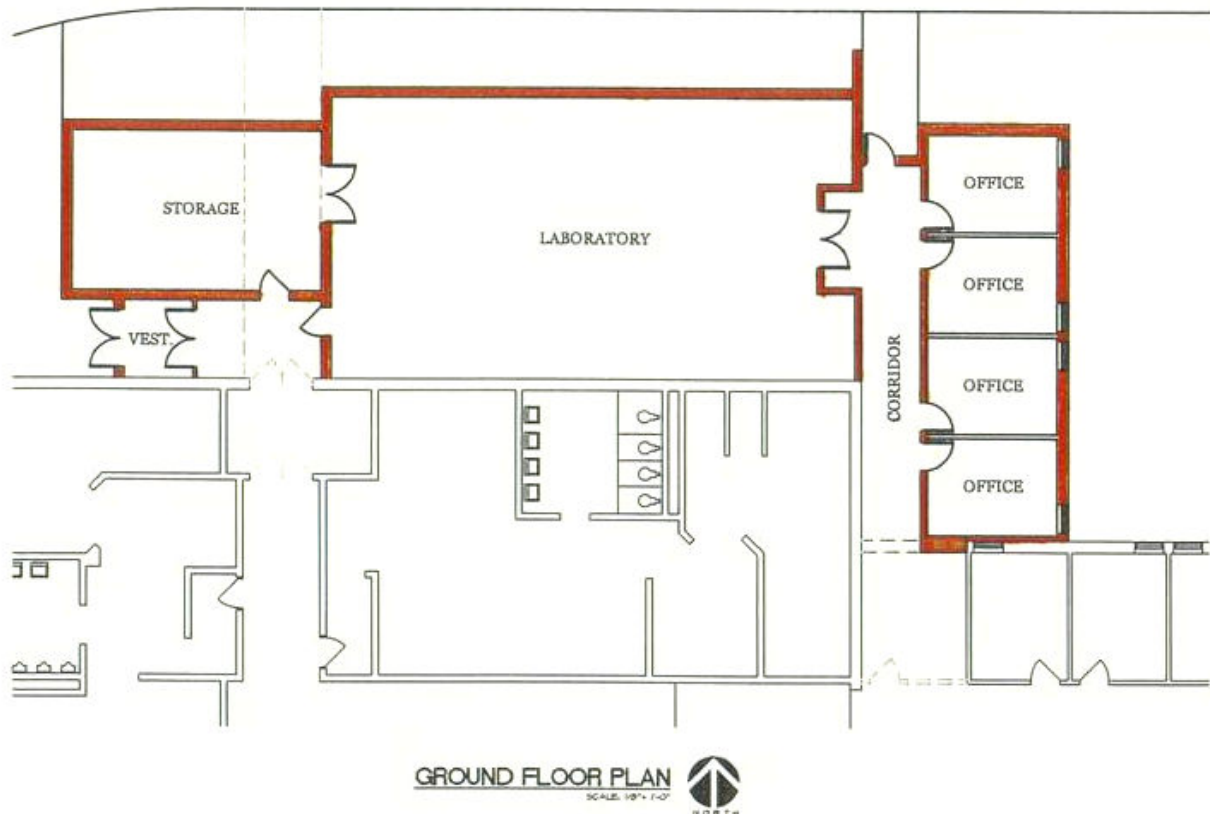
UW-Platteville is a four-year comprehensive university located in southwestern Wisconsin with an enrollment of 6,182 undergraduate and graduate students.⁷ The UW-Platteville College of Engineering, Mathematics, and Science has over 1900 student majors enrolled in ten degree programs. Bachelor of Science degrees are offered in chemistry, mathematics, civil engineering, electrical engineering, environmental engineering, industrial engineering, mechanical engineering, software engineering, engineering physics, and computer science.⁸

The two schools had previously established a transfer articulation agreement in engineering to ease the process of engineering students transferring to Platteville from UW-Fox Valley after two years. The existing agreement made this proposed collaboration a natural partnership, utilizing the faculty, pre-engineering curriculum and physical campus of UW-Fox Valley, and the ABET accredited mechanical engineering curriculum, faculty, and equipment of UW-Platteville. The collaboration agreement was signed in October of 2001 and the first mechanical engineering courses became available in the fall semester of 2002.

Construction for the new engineering facility on the UW-Fox Valley campus began in June of 2003. The floor plan of the new 3160 ft² engineering facility is shown in Figure 3. It included a 1595 ft² laboratory, 500 ft² of storage and four offices. Building construction costs totaled \$375,000.

Nearly an additional \$250,000 was spent on test and research equipment for the laboratory, which included a tensile testing machine; a material hardness tester capable of performing Brinell and Rockwell hardness tests; an impact hammer to measure impact energy or notch toughness of materials; a high temperature oven for heat treating metals; numerous new computers with current engineering software; a wide range of general research and test equipment that stocks the mechanical systems lab and the thermal-fluids lab, respectively.

Figure 3. UW-Platteville Engineering Wing at UW-Fox Valley



The effort to bring both of these programs to the Fox Valley was supported by a number of businesses, community leaders and local state representatives. The Fox Cities Chamber of Commerce and Industry, Kimberly-Clark Corp., Plexus Corp., Wisconsin Energy Corp. Foundation Inc., were notable in their cooperative efforts to bring the program to the area. Other donors are listed in Appendix A. The cost of the program was a one-time investment from supporting local industry of just under \$400,000 and the State of Wisconsin invests under \$410,000 annually.

Program Status

Since the program began with one full-time faculty member in the fall of 2002, the UW-Platteville Engineering program at UW-Fox Valley has grown to require two full time faculty members that each teach three to four courses/semester and four adjunct instructors that each teach one course/semester. The two faculty members are permanently assigned to the Fox Valley campus. All of the courses required for a mechanical engineering degree are offered within a one-year cycle between 4:30 p.m. and 10:00 p.m., Monday through Thursday. There are currently 10 courses offered per semester at Fox Valley. About every other semester a faculty member permanently assigned to the Platteville campus teaches a course at UW-Fox Valley.

The enrollment of UW-Platteville mechanical engineering program has grown from 7 junior- and senior-level students in the fall of 2002 to 41 in the fall of 2005; the course and enrollment history of the program is given in Table 1. The students range in age from 18 to 50 years and typically hold part-time or full-time jobs while attending late afternoon or evening courses. Many of them are technicians who hold associate degrees in engineering related fields from state technical colleges. In December of 2005, the first five mechanical engineering students graduated from the program⁹ and four more will graduate in the spring of 2006.

Table 1. Summary of Enrollment History in the Mechanical Engineering Program.

	FA 02	SP 03	FA 03	SP 04	FA 04	SP 05	FA 05
Number of courses	3	6	6	6	8	9	10
Class average	3	5.5	7.8	8	10.8	10.3	8.7
Number of students	7	18	18	33	34	35	41
Students contact hours	27	85	112	127	253	237	239

Number of courses – Total number of courses offered during semester.

Class average – Average number of students in each class.

Number of student – Number of students enrolled in UW-Platteville.

Student contact hours – sum of [(credit hours) * (number of students)] for each class

Due to the strong support of local industry, UW-Platteville has also launched a collaborative electrical engineering degree at the UW-Fox Valley campus that began offering courses in the spring semester of 2006 with an enrollment of three students.

Many of the 132 current UW-Fox Valley pre-engineering students also plan to pursue a mechanical or electrical engineering degree offered at UW-Fox Valley by UW-Platteville. A current breakdown of the UW-Fox Valley pre-engineering student population is described in Table 2.

Table 2. Number of Students in UW-Fox Valley Engineering Program

	Full-Time	Part-Time	Total
UW-Platteville ME Program	32	45	77
UW-Platteville EE Program	4	6	10
UW-Fox Valley Engineering	40	5	45
Total	76	56	132

UW-Platteville ME Program - Students currently enrolled in UW-Fox Valley engineering program who plan to finish their mechanical engineering degree at UW-Fox Valley in the UW-Platteville engineering program.

UW-Platteville EE Program - Students currently enrolled in UW-Fox Valley engineering program who plan to finish their electrical engineering degree at UW-Fox Valley in the UW-Platteville engineering program

UW-Fox Valley Engineering – Students currently enrolled in UW-Fox Valley engineering program who plan to transfer elsewhere after studying two years at UW-Fox Valley.

In establishing the engineering programs at UW-Fox Valley, UW-Platteville also provided a Student Services staff, consisting of a part-time Program Manager and a full-time Student Services Coordinator. These staff members meet with prospective students, evaluate credit transfers, advise current students, distribute textbooks, schedule UW-Platteville courses, coordinate scheduling with UW-Fox Valley, publish a quarterly newsletter, and maintain a database of all prospective, current and past students. They are also involved in recruitment and marketing, which involves developing promotional materials, meeting with local companies, membership in adult education consortium, and participating in education fairs at local companies. They also search and screen for adjunct faculty and host an orientation for new hires. They additionally provide students with career advising, which includes resume and interview preparation, co-op/internship preparation, and personality/preference testing.

Future Plans

UW-Platteville is considering offering one nighttime technical elective once a semester or once a year over a video link. This would give the UW-Fox Valley students more choices for technical electives and the opportunity to take more classes from the faculty at Platteville.

The UW-Fox Valley students have requested more involvement with UW-Platteville student associations. One option being considered is broadcasting some of the American Society of

Mechanical Engineers meetings and Society of Women Engineers meetings over video, especially those with guest speakers.

To develop the electrical engineering program on the UW-Fox Valley campus, UW-Platteville will be hiring a full-time faculty member in the fall of 2006 to teach three classes. Other courses will be taught using streaming video from the UW-Platteville campus.

Conclusions

The presence of undergraduate engineering education in the Fox Valley is a great benefit to area industry, students, and citizens. The evening classes provide an engineering program that is tailored to non-traditional students who are place bound by circumstance or preference. The local program allows area employees to advance in their profession and provide employers with needed engineering professionals, improving the local workforce. The program offers small class sizes and gives full-time students the opportunity to graduate in five years or less. Having engineering faculty on the campus is also an excellent resource for local industry.

Bibliography

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Appendix A - Donors for the UW-Fox Valley Collaboration with UW-Platteville

UW-Fox Valley Foundation
Bassett Mechanical
Menasha Corp.
AZCO
Harris Group
C.R. Meyer & Sons
OMNNI Associates
Integrated Paper
Appleton
Foth & Van Dyke
Banta Corp.
John J. & Ethel D. Keller Fund
Thrivent Financial for Lutherans
Coldwell Banker
Octoberfest Committee
Jacobs Engineering
MCA of Northcentral Wisconsin
Naight Telservices
Rockwell Automation
U.S. Oil Inc.
Associated Bank
Community First Credit Union
Fox Communities Credit Union
M&I Bank
Appleton Compressor
Borsche Roofing Professionals LLC.
Don Theobald Masonry
Festo Corp.
Oudenhoven Construction, Inc.
Tom Rathsack Excavating
Town & Country Electric
Werner Electric Supply Co.