

**University of Wisconsin-Milwaukee  
(UWM)  
College of Engineering and Applied Science  
(CEAS)  
Minority Programs, Initiatives and Partnerships**

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The primary purpose of the University of Wisconsin-Milwaukee is to provide Wisconsin's largest metropolitan area with a major comprehensive university. In the fall semester of 2003, UWM served over 24,000 students with a staff of about 3,000 employees and a 2003-2004 budget in excess of \$400 million. Given the size of the university and breadth of its mission, the student population and the programs in which they are enrolled is diverse.

Two of the four distinct groups of students served by the University are the undergraduates and graduate students, which comprise 93% (78% undergraduate and 15% graduate) of the student population. The other two groups are the undergraduate special students and non-degree candidates in the Graduate School. There is diversity within each of these groups.

The information presented is limited to data of the fall semester of 2003. Data for the spring semester of 2004 is available upon request. The Budget Office of Institutional Resource Analysis Research and Space Management within UWM monitors and provides reports on the enrollment of all students. This is the primary source used.

UWM serves a racially diverse population consisting of 7.1% African-American students, 2.1% Asian students, .8% Native American Indian students, 3.7% Hispanic students, 2.1% Southeast Asian students, 79.9% White students and 4.3% International students.

Women represent 55.8% of the total student population at UWM. The percentage of women varies considerably by school/college ranging from 13.5% in Engineering & Applied Science to 90.1% in Nursing.

UWM serves a racially diverse population consisting 15.8% while Milwaukee County demographics from the U. S. Census Bureau indicate that Milwaukee County alone consist of 34.6% minority. More recruitment of minorities is needed to reflect a more diverse institution that serves one of the largest metropolitan areas in the State. This is not to reflect negatively on the University, but to indicate that there is room for substantial improvement. Several programs and services have been and are being implemented to address this issue.

The College of Engineering and Applied Science consist of majors in Materials Engineering, Mechanical Engineering, Industrial Engineering, Civil Engineering, Electrical Engineering and Computer Science. There were 1863 students enrolled in the fall semester of 2003.

The College serve a racially diverse population consisting of 3.6% African-American students, 3.4% Asian students, .2% Native American Indian students, 2.8% Hispanic students, 3.9% Southeast Asian students, 74.5% White students and 11.6% International students. Therefore, only 10.5% of the students in the College are classified as Students of Color or minorities (i.e. African-Americans, Hispanics, Native American Indians, and Southeast Asians).

Again, with Milwaukee County being 34.6% minorities and the College only serving 10.5% Students of Color indicate that improvement is a necessity. If one would consider the surrounding counties such as Waukesha, Racine, and Ozaukee that make up a portion of the Greater Milwaukee Area, the number of students served would even be smaller. For example Racine County has a minority population of 20%, Waukesha County has 4% minorities and Ozaukee County has 3% minorities but the total number of students served by the College and the University includes students from these counties.

To state that work is needed in the area of recruitment is an understatement. Strides are being made, but much more is needed. The University of Wisconsin-Milwaukee and other institutions expend a significant amount of time examining factors that attribute to the success of students that includes recruitment, retention, and survival skills and/or

techniques. Research has shown that recruitment is a key component of attracting students, but recruitment alone is not enough. Studies have shown that recruiting Students of Color into engineering is multifaceted. The community and or families must be educated as to what a career in engineering is about and what engineers do. The career path must be introduced to prospective students at an early age so that they take the high school courses that lead to a college engineering curriculum. There is a tremendous need for mentoring and continuous dialogue with students so that they can understand and accept the process or timeline that is required to be an engineer.

There are a number of students that are prepared to meet the challenges in an engineering curriculum and go to college and succeed. However, many of those students are not attending UWM as their first choice. One of the areas the institution needs to put more emphasis on and perhaps manpower is attracting those students and encouraging them make UWM their first choice.

There are other high school graduates who have a perception of what engineering is about or their friends/family tell them that this is what they should pursue in college. The College needs to not only place information in the high school and develop rapport with guidance counselors, but to have seminars, interactive sessions with students, and information sessions in the community. The College must be represented and present in the events and activities among the youth and in the community.

Studies have shown that institutions including UWM have assigned personnel and developed programs to recruit students and meet the needs of incoming students as well as facilitate the adjustment of incoming students to the college environment. Authors, such as Vincent Tinto, W. G. Spady Jr., and A. W. Austin, have concluded that it is almost impossible to pinpoint the single, specific reason or program that will increase recruitment and retention of students in engineering colleges.

Other studies have shown that traditional methodologies used in the recruitment does not reach the masses of the Students of Color. There are other factors such as uncertainty, irrelevancy, incompatibility, and limited unrealistic expectations and academic underpreparedness that researcher have found to be the obstacles that institutions must address to increase enrollment and retention.

The University recruitment program is extensive with an entire department. The Department of Recruitment and Outreach is constantly recruiting students and works diligently with representatives in the College of Engineering and Applied Science. Recruitment is good but one must find prospective students.

The Milwaukee Public Schools (MPS) System is one of, if not the largest Public School System in the State of Wisconsin. In addition to being one of the largest systems in the State, it has the largest population of minority students. Reports released from MPS indicate that 84% of the students are minorities. Since UWM is in Milwaukee and the prospective students are in this area, one may conclude that there would be a larger number of minorities attending UWM.

There are other reasons why many of the minority students are either not attending UWM or remaining at UWM after their freshman year. One of the reasons stems from MPS announcement that the average ACT test results of African American students score is less than 18, while Southeast Asians, Hispanics and Native American Indians scores average is less than 21. One of the requirements for admission to UWM is an ACT score of 21 or higher. Those students in MPS who score higher than the indicated average go on to college and are very successful. However, those students generally do not attend UWM.

Another reason why minorities do not attend UWM is cost. Many of the student's GPA or ranking in high school does not qualify them for scholarship and they simply cannot afford the overall cost even with financial aid. There is also a limited amount of financial aid available to students and if they are admitted and are required to do remedial work, in many instances there is not enough assistance for them to complete their degree.

Another reason is that to obtain a degree may take five to seven years. For many minorities this is an eternity. There are other adversities and circumstances that they face daily that does not allow them to become dedicated and focused on higher education immediately following high school.

The reasons, some may call them excuses, continue and are real in their lives and within the community. But there are a large number of high school graduates that do not fit into any of these categories.

Many students that graduate from MPS go to college and are successful. They receive scholarships within the community and from foundations. They have good GPA's and have high rankings from high school and many of their parents support their endeavor in college and pay their tuition. But those students generally do not attend UWM. There are also those students that work and receive financial support from within the community, family members and financial aid, but the majority of them do not attend UWM.

The mission of the Office of Diversity in the College of Engineering and Applied Science (CEAS) at the University of Wisconsin-Milwaukee is encompassing and addresses many concerns. A strategic plan has been developed that promotes a collaborative culture through communication and acceptance of students, faculty, and staff. The Office of Diversity is responsible for meeting this challenge through participation in the UW System and the University of Wisconsin–Milwaukee's multicultural, diversity and community endeavors. The Office also reviews methods geared to increasing enrollment, improving retention and graduation rates of all students, especially for students of color. Therefore, the Mission of the Office of Diversity is to implement strategies and programs to meet the needs of diversity among students, faculty, and staff today and in the future, as CEAS prepares students for graduation, the workforce, and/ or graduate school. The Office of Diversity has initiated several programs and partnerships and services that are listed and summarized below:

**Summer Orientation Initiative: Bridging the Gap** – Many students of color have aspirations of being an engineer, but when taking the mathematics placement test, their scores place them in remedial mathematics. This program provides a stipend for those students to enter mathematics classes during the summer. This stipend pays for tuition only. In the summer of 2004, there are four students enrolled in remedial math courses. Beginning in fall, these students will register for college level math courses.

**Students of Color Orientation Forum** – Students, parents, college administrators, alumni and faculty are invited to a program that is designed to provide an overview of the engineering and computer science curriculum. This program also provides an opportunity for students of color to establish a networking mechanism with each other, making them feel a part of the college and highlighting the resources available on campus.

Retention is a high priority, and this program has been instrumental in providing a mechanism for parents and students of color to share common interests and problems. This program began in 2000 and attendance has been in excess of 100 engineering and computer science students of color. The Peer Mentoring Program was implemented as a result of one of these sessions.

**Peer Mentoring Program** - The Peer Mentoring Program grew from conversations with alumni students of color and the desire of the Director of Diversity to establish a connection, support, and network system between students in the engineering and computer science curriculum and those who have completed the curriculum. Students are more likely to succeed if they are comfortable in the college, understand how it works, and feel part of the environment. In order to feel this kind of connection, the focus is to establish meaningful relationships with other students, receive assistance from our staff, and advice from those who were successful in the curriculum and are productive in the marketplace.

Peer mentoring will provide this connectivity among students, alumni, and industry while allowing alumni to remain active in the college and be role models for future graduates. This allows volunteers from industry to view the development and growth of perspective employees. Programs of this nature provide the nurturing, and network opportunities that are vastly needed and meaningful to students. It also provides meaningful social opportunities to bring people of like disciplines and careers together.

Students are divided into groups according to their major at the Students Orientation Forum; members of the National Society of Black Engineers become the facilitators of the group, and an alumni of color (their mentor) with the same major is also assigned to the group. The group meets a minimum of twice a month without the mentor and

a minimum of once a month with the mentor. The facilitator documents a summary of all meetings. This program began in 2002 and the civil engineering group has investigated attending the National Civil Engineers Conference with their mentor.

**Summer Internship Pre-College & Engineering Initiative** - The Summer Internship, Pre-College and Engineering Initiative, is for an outstanding high school student with a minimum grade point average of 3.0 who also participates in outside activities.

The program runs for a period of three weeks during the summer with approximately 2/3 of the time spent with an engineering component and 1/3 of the time spent with the Pre-College Program. At the end of the three week session each student is provided a stipend of \$375.00.

Students work on engineering related projects. The project for Summer 2002 was to investigate and understand the works of a Rube Goldberg project as exemplified in the Wisconsin Rube Goldberg Contest, sponsored by the College of Engineering and Applied Science.

The Pre-College component was to address students in the Pre-College program (elementary and middle school students) as being a mentor for them as they see an individual that can set academic goals and achieve them while participating in other activities and in the community.

**Industrial Scholars Program** - envisions a model approach for recruiting, retaining, and providing minority engineers to local companies. The Industrial Scholars Program is a new and innovative joint scholarship/internship/educational experience program, which provides prospective minority engineering students with an appealing combination of money for college and an opportunity to gain priceless experience working in Milwaukee area companies.

The program provides a company the ability to develop a working six (6) year mentoring/relationship with a student from the end of their junior High School year through the senior year at UWM. Companies that participate in the program will

sponsor the students at approximately \$46,500. Part of this cost will be used for a six-year internship. The other funds will be used for direct scholarship support.

	H.S Jr.	H. S. Sr.	Freshman	Sophomore	Junior	Senior	Cost
Internship	\$1,200(a)	\$1,200 (b)	\$2,800 ©	\$2,800 (d)	\$ 5,000 (e)	\$0	\$13,000
Scholarship	0	\$2,800(f)	\$4,800	\$ 4,800	\$ 4,800	\$2,600	\$19,800
Administration	\$1,300	\$2,400	\$2,400	\$ 2,500	\$ 2,500	\$2,500	\$13,600
Total	\$2,500	\$6,400	\$10,000	\$ 10,100	\$12,300	\$5,100	\$46,400

(a) and (b) \$10/hour @ 120 hours or 3 week (summer months),

© and (d) \$14/hour@ 200 hours or 5 weeks,

(e) \$20.83/hour@ 240 hours or 6 weeks

(f) Fall semester tuition of the freshman year. These dollar amounts are equated as hourly wages but are actually stipends paid to the students for their learning experience.

The above table indicates funds submitted from the company yearly over the six (6) year commitment. This program is flexible and can meet the needs of the committed sponsor.

To address the underpreparedness, the Office of Diversity has submitted a proposal that would create an engineering focused high school for all students interested in becoming engineers or technical related fields. The vision or main goal for this school is to matriculate and encourage students to pursue a career in the engineering/computer science discipline. This school would accurately prepare the student with tools, math and science skills, that would produce a student with solid engineering skills that will be used to compete competitively in higher education. This school would take students who show a strong aptitude in math and science, based on their eighth grade test results, and enter them in an engineering focused program, which would result in a strong foundation of engineering principles and ideology. The partnership among the College, the high school and the parents, is another step in not only bridging the educational gap but also creating a link for recruitment and recruitment of students, and thus preparing them for the workforce.

With all of the programs and initiatives in place, they cannot be successful without partnerships, adequate funding resources, dedicated administrators and committed students.