

# Final Report on Implementation of the 1998-2003 Framework to Foster Diversity

*February 16, 2004*

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## INTRODUCTION

This report is a summary of activities and initiatives undertaken by the College of Engineering to implement the 1998-2003 framework for diversity and its seven challenges. The challenges are addressed in the following order:

- Challenge 1*—Developing a shared and inclusive understanding of diversity
- Challenge 2*—Creating a welcoming campus climate
- Challenge 3*—Recruiting and retaining a diverse student body
- Challenge 4*—Recruiting and retaining a diverse workforce
- Challenge 5*—Developing a curriculum that supports the goals of our new general education plan
- Challenge 6*—Diversifying university leadership and management
- Challenge 7*—Coordinating organizational change to support our diversity goals

Each of the supporting activities in this report is representative of the College's continuing long term commitment to creating and maintaining a welcoming, supportive and diverse community at The Pennsylvania State University. Additional data providing a longitudinal perspective of progress towards diversity are documented in the accompanying 2004-09 Diversity Strategic Plan.

## ***Challenge 1***

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### *Developing A Shared and Inclusive Understanding of Diversity*

In its strategic plan for 1997-2002, the College of Engineering (COE) articulates a commitment to develop an inclusive and diverse community through its stated initiative to “increase recruiting activities to create a more diverse student body, faculty and staff in the College; and to increase retention of women and minority students to equal majority retention levels.” In addition to these groups, the COE has made a concerted effort to initiate programming that encourages the inclusion of all members of the College. To successfully fulfill this mission, the College has supported several activities and initiatives in the interest of developing a shared and inclusive understanding of diversity.

- *The World-Class Engineer (WCE) Initiative* to “increase the diversity component within the engineering curriculum and continue to develop faculty and staff awareness of climate issues” is a commitment to the goal of producing “World-Class Engineers,” who are aware of the world, sensitive to cultural differences, and adept in working in diverse and multidisciplinary teams. Widely recognized and embraced by students, faculty and staff, the WCE framework has provided an effective vehicle through which the College projects and promotes its mission.
- *The Multicultural Engineering Programs (MEP) and the Women in Engineering Program (WEP)* have led the progress, and staffing has been added to enable those organizations to continue their missions. To minority students, as well as majority students, faculty and staff, the investment and commitment to diversity is visible in the College in the Multicultural Engineering and Women in Engineering Programs’ many activities described later in this document. As the support structures for four of the largest and most active student groups in the College, the National Society of Black Engineers (NSBE), the Society of Hispanic Professional Engineers (SHPE), the Society of Women Engineers (SWE) and Phi Sigma Rho, the programming sponsored by the MEP and WEP figure prominently.
- *Information Services* include the *Engineering E-News* announcements and notices, the Engr 588 course which provides TA and grader training in diversity, and establishment of a Student Activities Center. The latter has fostered even more collaborative projects and activities among the groups occupying that area, including the National Society of Black Engineers (NSBE), Society of Hispanic Professional Engineers (SHPE), Society of Women Engineers (SWE), Engineering Undergraduate and Graduate Councils, Envisioneers, Tau Beta Pi Honor Society, and several other student organizations.
- *The COE Climate Committee* recently completed a climate survey which is presently being analyzed. It is designed to monitor the climate as it is experienced by students, faculty and staff. The results for all three groups should be available later in 2004. The Committee is chaired by the Dean and consists of a rotating membership of faculty, staff and students. This information provide detailed input with which the COE can craft its future goals and programming.

## ***Challenge 2***

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### ***Creating A Welcoming Campus Climate***

The College has implemented a number of programs that contribute to creating a welcoming campus climate. The College continues direct interactions with faculty, staff and students, active participation with the Multicultural Engineering and Women in Engineering Advisory Boards, explicit inclusion of diversity in the Departments’ strategic planning and discussions with their Industrial and Professional Advisory Committees (IPAC), guidance of graduate admissions and faculty search processes, and familiarity with resources and procedures that can further the interests of diversity.

The College conducts an annual *Peer Review of Exceptional Performance (PREP)* program, wherein staff employees who have been in their current positions for at least two years and who have received outstanding performance evaluations can be nominated for two promotions within grade. Visible support is also evident by encouraging personnel to take advantage of opportunities for professional development, as many departments have noted in their strategic plans. The *College Climate Survey* is being implemented this year to identify areas of success or challenge as the COE continues to maintain a welcoming working environment. In addition, senior exit surveys are conducted each semester to assess the student perceptions of the learning environment in the departments and majors.

The College provides several orientation programs designed to acclimate and welcome newcomers. These workshops provided for students, faculty and staff, each include a diversity

component. Among the newest is the *Campus College Connection Program*, a multi-stepped retention program that targets underrepresented engineering first- and second-year students assigned to Campus Colleges who are later expected to arrive at University Park as juniors. A part of this program involves introducing them early-on to the University Park campus and welcoming them to the larger University they are a part of, regardless of geographical location. *Women Engineering Students at the Commonwealth (WESAC)* also provides e-mentoring, a newsletter to all engineering women on the campuses, and orientation activities for those who change assignment to University Park. There is also a *sexual harassment counselor network* in place to ensure that everyone has a forum to discuss misunderstandings. To foster student interaction, the *Student Activities Center*, home to a diverse population of several student organizations, provides a positive environment for students to collaborate and be exposed to a variety of cultural and technical viewpoints.

All of these activities contribute to efforts to create and maintain a welcoming climate for all of those interacting with, and working within, the College of Engineering.

### ***Challenge 3***

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#### ***Recruiting and Retaining a Diverse Student Body***

The focus of recruiting has been to develop and implement a process that not only involves outreach to primary, middle and early high school aged children, but then to tap into the “flow” in the pipeline towards science and engineering. The recruitment strategy has been designed and re-designed to constitute contacts, events, communications and incentives tuned to each stage in the recruitment cycle, from prospects’ initial college exploration, to the application stage, to “offered admission,” to the decision to go “paid-accept” with the recognition that the work on the student/college relationship has only just started at that juncture—when the student enrolls. The WEP and MEP lead many of the efforts that support these goals through outreach, recruitment and academic support programming. Following are the MEP and WEP programs that address each of these phases: Pre-College Outreach, Recruitment Efforts, Academic Support and Retention.

#### **Pre-College Outreach**

The WEP has initiated several activities that focus on the pre-college pipeline by incorporating hands-on, interactive activities and featuring undergraduate women as dynamic role models.

- *Girl Scout Saturday*—Workshops for girls of varying ages that focus on different aspects of engineering.
- *Move the Mountains (MTM)*—A camp for high school girls who have the right prerequisites, but who have not necessarily identified engineering as a possible major.
- *PSU4YOU*—A listserv for prospective women students, moderated by current undergraduate women, that talks about academic and campus life.
- *GEE (Girls Exploring Engineering)*—A website directed at introducing girls to engineering through activities attractive to late elementary and middle school girls.

Pre-college programs are also offered through the MEP in the summer and throughout the year to provide minority students’ exposure to Engineering and Penn State. These include:

- *VIEW (Visit in Engineering Week)*—A residential program for a total of 72 corporate-sponsored participants, involving a three-day session for 9<sup>th</sup> and 10<sup>th</sup> graders and two one-week sessions for 11<sup>th</sup> graders.

- *Society of Hispanic Professional Engineers (SHPE) High School Mentoring Program*—A weekend visit for 25-40 high school students bused from the Philadelphia area.

## **Recruitment Efforts**

The long-standing *Engineering Open House* and *Scholars Day* have been reformulated to include visits to the First-Year design labs where current students display and explain their projects. Both the WEP and MEP have special programs which are incorporated in the *Engineering Open House* to increase the numbers of participating underrepresented and women visitors. An active recruiting committee of the Penn State Engineering (alumni) Society (PSES) is composed of volunteers who make over 300 telephone calls to students in their home areas. The MEP and WEP organize phone-a-thons in which current students and/or advisory board members reach out to a similar number of ethnic minority and women prospects. Several recruitment efforts are conducted as a collaborative effort with the Schreyer Honors College, the Cooperative Education Program and Student Services to ensure that the widest possible audience is addressed.

The Women in Engineering Program has developed the *GE Faculty for the Future Fund* which sponsors research at the undergraduate and graduate levels. The WEP organizes the *Penn State Graduate School Information Weekend* for students who are juniors in college, with an emphasis on attracting women and students of color. The MEP coordinates the College's/Departments' participation in the Summer Research Opportunities Program (SROP) to attract talented undergraduates to real research experiences and encourage their subsequent enrollment in graduate studies. The WEP and MEP work with the College's Office for Graduate Studies, Research and Outreach (OGSRO) and departments to identify outstanding women and ethnic candidates for first year *Graduate School Minority Fellowships* and other "top-up" fellowships administered by the OGSRO.

The staff of the Multicultural Engineering Programs attends over ten national recruitment conferences each year in an effort to attract underrepresented students to the College of Engineering. The MEP also participates in many collaborative recruitment efforts through Penn State Admissions and the Penn State Recruitment Centers statewide.

## **Academic Support and Retention**

The MEP provides numerous academic support programs that address community building, retention, high school-to-college transition, award ceremonies and tutoring. A few of these programs are listed below:

- *PRE First-Year Engineering & Science Program (PREF)*—A six-week summer-bridge experience designed for first-year students who have been accepted in the College of Engineering at University Park.
- *Campus College Connection*—A multi-stepped program designed for students starting at Penn State Campus Colleges that begins with a 4-week summer bridge program, *Academic Summer Enhancement (ASE)*, and continues throughout the following two years with mentoring, campus visits, and other transitional activities. Students participating in the first full program in 2003 achieved an average Fall GPA that was .56 higher than their non-participating counterparts.
- *Community-Building Activities* such as the Welcome Back Picnic and the Peer Mentoring Program.
- *"Success 101" Engineering Seminar* that provides support for negotiating the first year in Engineering.
- *Academic Excellence Center* offering tutoring, computer access, homework files and additional learning tools for student support.

- *The E.A.T.T. Card (Educational Assistance Through Tutoring)*—A tutoring incentive program.
- *Book scholarship funding* offered as an incentive for students who improve their semester academic performance.
- *Resume Workshop and Resume CD* that provides students with exposure to industry job recruiters.
- *Student interaction and organizations*—The MEP director meets with Bunton-Waller fellows, attends NSBE, SHPE and the newly formed American Indian Science and Engineering Society (AISES) meetings and travels with students to organizational national conferences.

The Women in Engineering Program Orientation (WEPO) is the College's primary retention program for undergraduate women. WEPO is a three-day intensive introduction to engineering at the UP campus that emphasizes ownership of the physical space, community building and mentoring. All students participate in mentor teams led by two upper-division mentors and yearlong programming. WEPO has grown from 27 participants in 1996 to 127 participants in 2003. Participation by women of color runs between 6-8 percent, which is higher than the percentage of women of color in the overall engineering student population. WEPO has proven retention value with WEPO women being retained at a higher rate than non-participants. Other key retention activities sponsored by the WEP are:

- *Facilitated Study Groups*—Recruitment of upper-division students to lead study groups in most of the first and second year courses required for engineering majors.
- *WESAC (Women Engineering Students at the Commonwealth)*—Includes a campus college listserv, website, and newsletter as well as e-mentoring of students currently at non-UP campus locations by students who have already changed assignment to UP, SWE chapters at three campuses, and orientations for change of assignment students.
- *L-WEPPSU*—This listserv reaches 800+ women and delivers information about scholarship opportunities, jobs and internships, current events, etc.
- *WEP Scholarship Program.*
- *Undergraduate research* for upper level women (see above).
- *The Society of Women Engineers (SWE)*, one of the largest and most active student groups in the college.
- *Phi Sigma Rho*, a national engineering sorority initiated at Penn State in Fall 2001.
- *A suite of courses* including *Wellness Strategies for Women Engineers, Career Strategies for Women Engineers, Enigmatic Computers* and *Lab and Shop Skills.*
- *A leadership project* that includes WEP interns, project managers, mentors, volunteer and paid instructors and service activities.
- *Monthly Grad/Faculty Networking Lunches* that in 2000-2001 attracted a total of more than two hundred graduate and faculty women and provided informal mentoring experiences for graduate women as well as junior faculty women.

Scholarships are also a significant factor in retaining and recognizing the achievement of undergraduates. During the period from AY 1995-1996 to AY 2002-2003, the number of scholarship awards to minority students has increased from 30 to about 115, and the total value of the awards has tripled to over \$300,000 per year. The awards to women students has grown from 84 (totaling \$106,000 in 1995-96) to 387 (totaling \$741,000) in 2002-03. The College has increased the average award across all recipients from \$1,370 to \$2,260 over this period. In the most recent ASEE report of degrees awarded nationwide in engineering, Penn State ranked 5<sup>th</sup> in total degrees to women and 2<sup>nd</sup> in B.S. degrees awarded to women.

## ***Challenge 4***

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### *Recruiting And Retaining A Diverse Workforce*

The College of Engineering is actively engaged in locating and recruiting faculty through professional networks, societies, peer contacts and national advertising. In addition, early identification, open searches and dual career hiring has allowed the College to aggressively recruit talented couples to tenure track faculty positions. Retention strategies include the *Monthly Grad/Faculty Networking Lunches* designed to provide informal mentoring experiences, the *Council of Senior Faculty Women* to provide leadership for women faculty, the *Peer Review of Exceptional Performance (PREP)* program designed for staff recognition and promotion, the *Engineering Administrative Fellows Program*, the *Office Professional Excellence Certificate Program*, and a wide variety of the leadership and management programs offered by the Human Resources Development Center. The College also encourages faculty and staff to apply for the University Administrative Fellowships. All of these strategies help to ensure that faculty and staff members, particularly women and minorities, are included in the life of the College, are given good supervision and services, receive informal mentoring by senior faculty and are provided opportunities to join research teams and funding opportunities. One positive example of this would include the WEP-sponsored two-day visit to the National Science Foundation undertaken by 24 women faculty and staff in Fall of 2003.

The number of women on the College of Engineering faculty continues to increase and the number of underrepresented minority faculty has grown to a highest ever 13 faculty members (see Figure 14 of the 2004-09 Diversity Strategic Plan). Female faculty have continued to steadily increase since 1985 from 3 faculty women to 40 in 2003, or 14.3% (Figure 13 of the 2004-09 Plan). The College had the highest percentage of female faculty among engineering colleges ranked among the Top 25 in the April 9, 2001, *U.S. News & World Report*. The statistics on female faculty members are from a national survey initiated by the Engineering Deans Council. The average percentage of female faculty in these institutions is 8.39% and the median percentage of female faculty is 8.51%. Penn State ranked seventh in the percentage of minority faculty with a current value of 4.7%. The average percentage of minority faculty is 3.49% and the median percentage is 3.34%.

## ***Challenge 5***

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### *Developing A Curriculum That Supports the Goals of Our New General Education Plan*

There are a several courses, seminars and research opportunities that support the philosophy of incorporating diversity in the learning environment. These include a variety of courses offered through the Science, Technology and Society Program, several of which have been approved as meeting the Intercultural and International Competence requirement. Other structured learning environments which advocate for cross cultural learning and sharing of ideas include:

- *The First Year Seminar Programs* such as “Success 101” offered by the MEP and “Toy FUNDamentals” offered by the Department of Mechanical and Nuclear Engineering and the WEP.
- *Cluster courses* in first-year engineering design, math and physics curriculum and a math “orientation” course that meets the General Education speech communications requirement by engaging students in explaining and interpreting mathematical concepts in layperson terminology. A common element of these courses is the control exercised in the registration process, such that the enrollment can be balanced or students clustered together to combat the sense of isolation felt by women or students of color.

- A suite of *career development courses* designed to prepare women engineering students for the workplace.
- *Research opportunities* where students can work one-on-one with faculty, such as the *Women in Science and Engineering Research* program, *GE Faculty of the Future* project and *Summer Research Opportunity Program (SROP)* for underrepresented students.

In conjunction with the *World-Class Engineer* initiatives, the Dean appointed a task group on *Global, Societal, Ethical and Professional Aspects of Engineering* to recommend and implement programs that will broaden students' understanding of these elements in their education, careers and professional lives. An annual summer workshop for faculty, organized by the Leonhard Center and Rock Ethics Institute, on how to integrate these topics into the curriculum is one of the outcomes of the Task Group. A good example of curricular integration is the *Alliance for Design* project, wherein students in ED&G 100 work with teams in a partner French institution on collaborative design projects. The team with the most successful design solution travels to France for an escorted industry tour, and their French counterparts are invited to visit the United States. This project has recently been expanded to include collaborations in several other countries with support from a successful FIPSE grant.

## ***Challenge 6***

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### ***Diversifying University Leadership and Management***

Faculty and staff members are encouraged to acquire leadership skills through participation in various professional development programs offered at the College and University levels. These activities are important to expanding the locus of experience from Department to College and University levels, and thus, to enhance participants' viability as candidates for academic leadership director positions.

The *Academic Council*, an expanded group composed of the Executive Committee and directors of key programs (such as the MEP, WEP, Student Services, and Graduate Studies) was created "to advance the College's efforts in continuing to build a strong and supportive academic climate for a diverse group of students, staff and faculty." Directors of the College's research centers and institutes are also regularly invited to participate at Executive Committee meetings.

At the staff level, the College offers the *Engineering Administrative Fellows Program*, initiated in 1991. The program's goal remains to provide staff members with an opportunity to serve fellowships with higher-level staff members in different administrative offices of the College. Since the program's inception, 26 people have participated in the program of which 23 were women and 1 minority. Twenty former fellows have been promoted to higher graded positions.

Diversifying the leadership in the College naturally revolves around continuously developing people towards leadership and its related higher-level skills and exploiting available opportunities to make immediate changes that will add diverse perspectives in key decision-making.

## ***Challenge 7***

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### ***Coordinating Organizational Change To Support Our Diversity Goals***

The College has made substantial investments and devoted broad-based attention and resources to further its diversity initiatives. The original College support for the MEP and WEP included directors for each program and a shared staff assistant. The staff has been increased to include full-time associate directors and staff assistants for both programs beginning Fall 2001. Aided by external funding and the aggressive, carefully crafted strategies of the MEP and WEP directors,

the programs have been able to expand to ensure outreach to—and contribution from—the departments, faculty and staff in the areas of recruiting, curricular reform, community-building, and mentoring activities with currently enrolled students.

The College Relations Office, Office for Undergraduate Studies and Office for Student Services (comprised of the WEP, MEP, Advising Center, and Cooperative Education and Internship Program), have developed into a successful, collaborative team, cooperating on proposals for external support. This collaboration has garnered financial support from several large key sponsors including the GE Fund, Corning, the National Science Foundation, Alcoa, GEM, W.E.P.A.N., Texaco, Fluor, Boeing, Air Products and Chemicals, Dow Chemical, Hemler/Burns/Roe Enterprises, DuPont, NASA, GM, GTE, Lockheed-Martin, Mobil, NACME, Armstrong, and others. The external support has permitted new program development as well as the institutionalization of programs initiated with seed funding from University sources, such as the Equal Opportunity Planning Committee (EOPC), Center for Learning and Teaching, Office of Undergraduate Education, Summer Sessions, and others. The active roles played by the Leonhard Center and Engineering Instructional Services and involvement of graduate assistants and other personnel from the Colleges of Education and Science, have been instrumental in developing sound pedagogical foundations and formative assessment methodologies with which to create, evaluate and improve the programs.

Contributions from College resources and capital improvement fund allocations have significantly enhanced the physical facilities available for academic and support services. These include the creation and later expansion of the Office for Student Services, the development of the *Student Activities Center*, renovation of and associated expanded access to the *Kunkle Activities Center*, and refurbishing and renovation of the *MEP Academic Excellence Center*. The commitment of State grant and tuition surcharge funds to the *Center for Engineering Design and Entrepreneurship (CEDE)* has significantly improved the access available for summer programs, student organizations, workshops, hands-on First-Year Seminars and other activities/groups to appropriate spaces and instrumentation. All of these improvements were designed around the theme of providing a more welcoming, community-oriented and collaborative environment for academic support services and personnel, and enhanced engagement of student teams and organizations.